DOCUMENT RESUME

ED 283 843 TM 870 359

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TITLE Writing to Read Program, 1985-86. Fort Worth Independent School District.
INSTITUTION Fort Worth Independent School District, Tex. Dept. of Research and Evaluation.
REPORT NO PE86-515-14
PUB DATE Jun 86
NOTE 115p.
PUB TYPE Reports - Evaluative/Feasibility (142) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Classroom Observation Techniques; *Computer Assisted Instruction; Cost Effectiveness; Grade 1; Inservice Teacher Education; Interviews; Kindergarten Children; Microcomputers; Primary Education; *Program Evaluation; Program Implementation; Questionnaires; *Reading Instruction; Reading Skills; Research Design; School Districts; Socioeconomic Status; *Writing Instruction; Writing Processes; Writing Skills
IDENTIFIERS *Fort Worth Independent School District TX; Writing Samples; *Writing to Read

ABSTRACT

Writing to Read (WTR) is a computer-based instructional system designed to develop writing and reading skills. In the fall of 1985, the WTR program was implemented for the first time in some kindergarten and first-grade classes in Fort Worth Independent School District, (Texas) elementary schools. Research was conducted to evaluate: (1) the implementation of the WTR programs; (2) its effectiveness in developing students' writing and reading skills in comparison to students of similar socioeconomic status in non-WTR classrooms; and (3) the costs of continuing the WTR program at the same level of operation. Data were collected from classroom observations, staff interviewers' collected writing samples, and results of the reading subtest of Iowa Tests of Basic Skills. Continuation costs were based on lab aides' salaries, materials used, and equipment maintenance and repair. The teachers, principals, and aide were positive about the program. The findings with respect to the outcome measures of reading and writing were much weaker than expected. Due to a poor implementation design that did not allow for the assessment of the relative contribution of WTR in comparison to competing programs, the cost-effectiveness of WTR could not be validly evaluated. Writing process instruction showed promise as as cost-effective alternative. Appendices include the observation form, questionnaires, a description of writing process instruction, instructions for collecting writing samples, kindergarten and first-grade scoring criteria, examples of kindergarten and first-grade writing samples, a letter soliciting teachers' participation in scoring of writing samples, tallies of scores on kindergarten and first-grade training samples, repair cost of IBM PC Jrs under an IBM service contract, and estimated costs of computer repairs under district maintenance plans. (JAZ)

FORT WORTH INDEPENDENT SCHOOL DISTRICT
FORT WORTH, TEXAS

ED283843

WRITING TO READ PROGRAM
1985-86
PE86-515-14

DEPARTMENT OF RESEARCH AND EVALUATION

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FORT WORTH INDEPENDENT SCHOOL DISTRICT

WRITING TO READ PROGRAM
1985-86
PE86-515-14

Nancy K. Naron
Evaluator

Department of Planning, Research, and Evaluation
Dan Powell, Director

June 1986

ADMINISTRATIVE SUMMARY
WRITING TO READ PROGRAM

Owner's Code:	136	Cost per Student:	$236
Cost of Program:	$440,508	Funding Source:	Excellence and Local
Number of Students:	1,867	Number of Schools:	16 (see back)
Number of Staff:	16 Aides		

DESCRIPTION: Writing to Read (WTR) is a computer-based instructional system which provides structured activities for one hour each day within the context of a planned learning center. A full-time aide works with each teacher in this center.

POPULATION SERVED: The program primarily serves kindergarten and first-grade students.

OBJECTIVE: The objective is to develop the writing and reading skills of the students served. Students are encouraged to express their own ideas in writing and to read what they have written.

RESEARCH FINDINGS: The teachers, principals, and aides were overwhelmingly positive about the WTR Program. Most of the implementation problems encountered early were rectified by the end of the year, but there were numerous equipment problems throughout the year. Some of the teachers felt that the program was better suited for some students than others. Based on two rather limited studies, WTR kindergarteners were found to score higher on reading than non-WTR kindergarteners, but minimal differences were found for kindergarteners in writing skills. No differences were found between the reading and writing skills of WTR first-graders and those of non-WTR first-graders. Writing Process instruction showed promise as a cost-effective alternative.

CONCLUSIONS: WTR is clearly an exciting but expensive program. Unfortunately, due to a poor implementation design that did not allow for the assessment of the relative contribution of WTR in comparison to competing programs, the cost-effectiveness of WTR could not be validly evaluated. However, the findings with respect to the outcome measures of reading and writing were much weaker than expected.

RECOMMENDATIONS:

1) Examine the overall goals of the K-12 language arts curriculum, identify weaknesses, and set priorities.
2) Identify promising programs which meet these needs.
3) Pilot alternatives in a planned variation design to allow for meaningful evaluation of each program's cost-effectiveness.
4) Do not expand the WTR Program until after comparing its cost-effectiveness to other alternatives.
5) Transfer fiscal responsibility of the program to each site, and use discretionary funds to pilot cost-effective alternatives.

Program Manager: Millicent Jones
Evaluator: Nancy K. Naron
Date: June, 1986

3 - Worth Heights

4 - North Hi Mount

7 - Morningside

#26 - Washington Heights

#42 - Helbing

#43 - S. S. Dillow

#44 - Westcliff

#47 - Mary Louise Phillips

#55 - Mitchell Boulevard

#65 - Waverly Park

#67 - A. M. Pate

#68 - Bruce Shulkey

#75 - Versia L. Williams

#76 - Maude I. Logan

#78 - Maudrie M. Walton

#81 - Sunrise

Acknowledgements

The evaluation team would like to thank Dr. Norbert Elliot, Assistant Professor at East Texas State University, for his very able assistance and advice in the design and implementation of the writing assessment study.

We are particularly grateful to Arlington I.S.D. for allowing two of its first-grade Writing Process classrooms to participate in the writing assessment study.

And of course, we especially thank all the children who enthusiastically demonstrated the high level of creativity and expression at which young children are able to write.

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Writing to Read
First Year Program Evaluation
June, 1986

WHAT IS THE WRITING TO READ PROGRAM?

Writing to Read (WTR) is a computer-based instructional system designed to develop the writing and reading skills of kindergarten and first-grade students. The objectives of the program are to help the students develop their ability to express their ideas on paper and to read what they have written. However, the program developers did not specify detailed objectives or concrete expectations of how much better students in WTR should read and write than students in traditional programs.

The program is provided within the context of a planned learning center, which is staffed by a full-time aide. The students spend from 30 to 60 minutes per day, accompanied by their teacher, using the equipment and materials in the WTR center. This center, or lab, is organized into at least five learning stations according to guidelines outlined by the WTR developers.

One of the main learning stations in the WTR lab is the Computer Station. The aide directs the students' activities at this station. Students proceed through a series of ten instructional cycles which teach some basic vocabulary words using a phonemic spelling system. In addition, practice activities are available on the computer to reinforce the skills learned in the instructional cycles. A great deal of repetition is a central part of the computer activities.

A second learning station is the Work Journal Station. The Work Journals are designed to provide additional support and practice in the learning of the material in the ten instructional cycles. Some of the pages are designed to be completed in conjunction with an audio tape. The main activity is to practice writing the cycle words in a number of formats.

A third work station is the Writing/Typing Station. In one area of this station, students write stories by hand. In the other area of this station, students type their stories on computer using a word processing program.

In a fourth work station, called the Listening Library Station, the students have the opportunity to match speech with written language. They listen to stories recorded at a slow pace on tape while following the written text in the corresponding book.

The fifth required station is the Make Words Station. Various activities are arranged to have the children practice matching letters and sounds using manipulatives and appropriate alphabet materials.

HOW WAS WTR IMPLEMENTED IN FWISD?

Beginning in the fall of 1985, the WTR program was implemented for the first time in 16 elementary schools. In nine of these schools, the program was implemented only with kindergarteners. (In one of these nine schools, one kindergarten class of orthopedically handicapped students was included in the program.) In five of the schools, both kindergarteners and first-graders were included in the program. At one school, multi-age classrooms (four- and five-year-olds together and first- and second-graders together) were included, while at another school, the program included only first- and second-graders.

Description of the WTR Schools. Of the nine schools using the program with kindergarteners only, all but one are minority schools with at least half the children on the free and reduced meal plan. None of these schools has more than four percent of its students who are limited English proficient.

Of the remaining seven schools that use the program with first-graders as well as with other grades, the profile of the schools is much more varied. The percent of students on the free and reduced meal program ranges from 21 to 81

percent, and the percent of students classified as limited English proficient ranges from zero to 76 percent.

Data Collection. Information about the implementation of the WTR program was gathered at two stages during the school year: (1) during initial implementation in the fall, and (2) at the end of the school year in May.

Observations of WTR classrooms were conducted during both phases of implementation. During the fall, four evaluators each observed four WTR classrooms, including one class observation at each of the 16 sites. Each observation included the entire lab session as well as about 20 minutes of class time prior to the lab activity. These observations were conducted within the first month or two of program implementation. In addition, structured interviews were conducted with each teacher observed and the principal at each school (see Appendix A).

In the spring of the school year, the same four evaluators observed two to four WTR classes each, for a total of eleven classrooms observed. Each site visted in May had also been visited by the same evaluator the previous fall, although not necessarily the same classroom. In addition, a one-page questionnaire was distributed to every WTR teacher, aide, and principal (see Appendix B). The questionnaire was completed and returned by all 16 aides, 15 of the 16 principals, and 73 teachers (55 kindergarten, 15 first grade, 2 second grade, and one teacher of both first- and second-graders). The level of teacher response was approximately 85 percent of all the WTR teachers.

Initial Implementation Status. Based upon the observations and interviews conducted in the fall, an interim report was written which outlined the following statements to summarize the findings of the initial implementation effort.

1. Overall Reaction

Writing to Read (WTR) has generated a great deal of enthusiasm and excitement across the district.

- Principals and teachers all expressed positive feelings about the potential of the program.
- Students clearly enjoyed going to the lab.
- The program has been well received by the community. Principals reported that WTR is an excellent public relations tool.

2. Readiness Levels

Children were observed as being in various stages of readiness for the program, with some kindergarteners not cognitively prepared for the program and some first-graders bored with parts of the program.

- Some children were observed randomly typing, just sitting, or talking to each other.
- Some kindergarteners could not make the correspondence between upper and lower case letters.
- Some teachers reported feeling pressured to start using the lab before they felt their students were ready.
- Aides indicated seeing wide variations in the ability and readiness levels of the children both within and across classrooms.

3. Physical Aspects

Inadequacies were noted in various physical aspects of the program.

- There were shortages in equipment, materials, and furniture.
- Staff reported frequent operating problems with tape recorders and headphones.
- Some furniture used was of inappropriate size for young children.
- The space available for the WTR lab was very limited in at least three of the schools.
- Lab storage space was inadequate in some buildings.

4. Monitoring

Monitoring of the children's work in the WTR lab was observed to be somewhat limited, resulting in some children saying or doing the wrong thing, with no correction provided.

. The majority of teachers spent time motivating and guiding students in the handwriting activities.

. The majority of aides monitored the activities in the Computer Station.

. In some classrooms, the Work Journal items were written incorrectly.

. Some children in pairings did not actively participate in the lesson.
. Some children in the Listening Library were turning the pages of the books by listening to the "beeps" with no attention to the stories.

. In many schools, children were not linking the handwriting activities with the typing activities.

. Children were on task more often when both the aide and teacher monitored all stations as needed.

5. Implementation Variations

There were many different variations in type and degree of implementation of the program both across schools and within schools.

. The procedure for rotating from station to station varied from a rigid schedule of every 15 minutes dictated by a timer to students individually choosing when they moved to a new station.

. Some teachers did some of the WTR activities in the classroom rather than in the lab, such as the Work Journals or handwriting activities.

. Some teachers chose to not use the tape player as part of the Work Journal station.

. In some schools, the Writing/Typing station was broken into two stations with no linkage made between the two.

. In at least one school, the teachers each brought different materials to the lab and did not share them as general lab materials.

. The amount of coordination and communication between teacher and aide varied considerably.

6. Time-on-Task

Instructional time-on-task differed from class to class.

. Some classes went to lab only four days a week; most used the lab five days a week.

. The amount of time spent in the lab ranged from 30 minutes (for some first-grade classes) to one hour for most of the classes.

. A great deal of instructional time was lost to partner-pairing, grouping, and other management tasks.

. Some kindergarteners in the late afternoon sessions were observed to be too tired to actively participate in the lab at that time.

. Two schools used the lab only four hours a day.

7. Training

Some teachers and aides expressed the need for additional training.

. Some teachers were unsure of what was expected of their students.

. Some aides did not feel comfortable regarding the set up, use, and maintenance of the equipment.

. Some staff members stated that the inservice training had not met their needs.

8. Philosophy

The philosophy of the WTR program differs from what the teachers have used in the past.

. In nearly all the classroom settings observed prior to the WTR lab activities, the teachers did not reinforce the application of the phonemic sounds learned in the lab.

. Teachers and aides did not consistently emphasize the articulation of the phonemic sounds while in the laboratory setting, resulting in a climate that was visually rather than auditorally dominant.

. Some teachers expressed concern regarding the difficulty in implementing both the WTR and the district curriculum.

. Some staff expressed concern regarding teaching a phonemic system which differs from correct English spelling.

9. Parent Involvement

Staff reported very minimal parent involvement in the program.

10. Summary

Overall, the WTR program was not being implemented in a consistent fashion, and many WTR staff did not know to whom to direct their questions.

Based upon these findings, one important recommendation was immediately heeded: a full-time WTR coordinator was assigned to closely monitor the program and help staff implement it appropriately.

<u>End-of-Year Implementation Status</u>. By May of 1986, many of the problems observed in the fall had been addressed and corrected. The WTR coordinator visited every

WTR classroom at least once, about half the WTR classrooms at least twice, and those targeted by principals as needing improvement more than twice. In the early part of the year, she focused her attention on improving the management strategies utilized in the WTR labs. As the teachers and aides became better managers, the WTR coordinator then focused on improving the teaching strategies used in the Writing/Typing Station. She modeled for the teachers various approaches aimed at increasing the students' level of writing skills.

The following findings summarize the WTR program implementation status as of May, 1986. The findings are organized according to the same categories as those of the initial implementation status, in order to highlight the changes that occurred across the year.

1. Overall Reaction

The excitement and enthusiasm generated by the WTR Program at the beginning of the year grew considerably throughout the year.

- Of the 15 principals who responded, 13 were overwhelmingly positive, one had a "wait and see" attitude, and one did not respond to the question regarding the principal's general feelings about the program.

- Of the 73 teachers who responded, 45 (about 62 percent) were very positive about the program, with comments ranging from "good" to "great," to "excellent," to "very stimulating." Two teachers were highly critical of the program and one was "ambivalent." Five teachers did not respond to the question regarding their general feelings toward the program.

- The remaining 20 (about 27 percent) felt the program might work more effectively under some conditions than others: 15 said the program works better with some students than others or that they need different level materials for the program to work better with their students. The other five teachers gave other types of conditions under which the program would work more effectively (e.g., "care must be taken to encourage creative writing instead of making good spellers and copiers of known information"). There were no obvious differences among feelings according to grade level.

- The response from the 16 WTR lab aides was very similar to that of the teachers. Twelve of them were highly complimentary of the program. Four of the aides made conditional statements, such as, "WTR is good if teachers use it properly."

2. Readiness Levels

- Of the 52 responding kindergarten teachers, 29 reported that at least three-fourths of their students were ready to begin the program in the fall, 9 reported that from one-fourth to one-half of their students were not ready for the program, and 14 of the kindergarten teachers reported that over half their students were not ready to begin the program in the fall.

- Of the 17 first- and second-grade teachers who responded, six reported that over half their students found the beginning cycles too easy, and another six teachers reported that from one-fourth to one-half of their students found the beginning cycles too easy.

- Of the 52 responding kindergarten teachers, 20 reported that less than three-fourths of their students completed all ten instructional cycles, and more than half the kindergarten teachers reported that over one-fourth of their students had to repeat at least half the instructional cycles. At the first- and second-grade level, 6 of the 18 responding teachers reported that less than three-fourths of their students completed the instructional cycles, but very few first- or second-graders had to repeat the cycles. One explanation for why this might have been the case is that most of these older students probably did not complete the cycles because they found them too easy.

- In terms of the use of the reinforcement software (Silly Sentences and Cat and Mouse/Turtle and Rabbit), about 35 percent of the teachers reported using it with nearly all their students, while about 20 percent of the teachers reported using it with less than one-fourth of their students. First-grade students tended to use it more than kindergarteners.

- In terms of the students' response to the repetitious nature of the instructional cycles, about 62 percent of the kindergarten teachers reported that most students stayed interested, 29 percent reported that some stayed interested while others got bored easily, and about 9 percent reported that most of their students got bored easily. As one might expect, higher percentages of the older students got bored easily than did the kindergarteners. About 38 percent of the first- and second-grade teachers reported that most of their students stayed interested, an equal number reported that some students stayed interested while others got bored, and 22 percent reported that most of their students got bored.

- As mentioned in the section regarding overall reaction, 15 of the responding 73 teachers mentioned the program being better suited for some children then others. Unfortunately, there was no obvious trend in these comments. Some teachers felt it was better suited for first-graders, while others felt it was not challenging enough for first-graders. Some kindergarten teachers felt that it was too difficult for their students, while others felt the program worked better with their "below average" students. Some teachers simply stated that the program worked better with some children than

others, without specifying which type student or the reason. Without having more systematic information, one cannot target the population for which the program might be most effective.

. Seven teachers (about 10 percent) stated that the program should be used only when the students are ready, or that it should be introduced the later part of kindergarten or beginning of first-grade.

. Of the seven principals who use the WTR program for more than one grade level in their school, all but one felt the program was equally appropriate for the different grade levels. One principal felt it was more appropriate for kindergarten than for first grade.

3. Physical Aspects

. With regard to the equipment used in the program, about 40 percent of the teachers reported having had problems with the headphones, the computers, and the tape recorders, and 25 percent reported having had problems with the printers. The most often mentioned comments about the headphones were that often one could not hear or hear clearly through them and that they broke down too easily. With regard to the computers, by far the most frequent comment was that they broke down often. The range of comments about the tape recorders and printers was quite varied.

. According to information furnished by the FWISD Business Machine Repair Shop, during the seven-month period from October, 1985, to May, 1986, there were 99 calls for service on the 128 IBM PC jrs. used in the WTR Program. This rate of service calls (77 percent) is higher than for any other type of computer that is used in the district. For example, ten system boards (a system board is a very expensive and important part of the computer) were needed to repair the PC jrs. during these seven months; in contrast, the district has needed no system boards for Apple computers and three system boards for Tandy computers in the last two years.

. Of these 99 repair calls, 80 were serviceable by the district, while 19 units had to be sent to IBM in Dallas for major repair work. If these machines had not been under warranty, the cost of repair would have been so high that these machines would have been "scrapped" by the district.

. In terms of materials, about 20 of the teachers made comments regarding the need for more materials. The most frequent response was the need for more advanced materials and software to go beyond the tenth instructional cycle. Some teachers mentioned the need for more materials and software for the younger or less well prepared student. A few teachers mentioned the need for more books in the Listening Library Station and more materials in the Make Words Station.

. In the three WTR schools with limited space, no provisions were made to alleviate the space problem. In one school in which the WTR lab

was housed on the stage, the temperature was so hot at times that it affected the operation of the computers.

4. Monitoring

- Of the 11 WTR classrooms observed in May, no monitoring of the students' performance by the teacher or aide was observed in three classrooms. In six of the classrooms, monitoring was typically centered on the computers by the aide and on the Writing Station by the teacher. In two of these six classrooms, students at the Listening Library were observed to need direction, and in one of these classrooms, additional monitoring was needed at the Writing Station. Excellent monitoring of the students' performance in all stations was observed in two of the 11 classrooms. In one of these two classrooms, three aides were present.

- Of the 16 WTR aides, 13 reported on the questionnaire that they circulate throughout the lab and monitor all activities. However, of the nine aides observed, six assisted students at the computers and/or typing station, two circulated throughout the lab, and one assisted students at the computers and with writing as needed.

- Children observed in the Listening Library Station typically did not follow the written story visually but just turned the pages according to the verbal instructions on the corresponding tape.

- In two classrooms, children who were playing games designed to teach sound and letter correspondence were observed making only visual and not auditory matching, with no correction provided.

- The amount of guidance provided to students in their writing varied greatly from class to class. Of the 11 classes observed, only one teacher gave the students a topic or theme to write about if they lacked other ideas. At least five of the observed teachers asked the students to read their stories aloud, but two of the teachers read the children's stories to themselves rather than asking the students to read them to the teacher. In two classrooms, most of the students only copied cycle words as their "writing." In all but one of the eleven classrooms, the teacher and/or aide helped the students to sound out words. Other assistance was with spelling, sentence organization, and pronunciation of words.

- All levels of writing were observed across the 11 classrooms, from nonsense words to well-structured stories. In two of the classrooms, the children's writing was dominated by the cycle words. In four of the classrooms, the level of writing ranged fairly evenly from single letters to stories. In the remaining five classrooms, most of the students were writing simple sentences but not well organized stories. Although the teachers and aides provided a great deal of encouragement to the students, not a great deal of direct instruction or appropriate prompting was observed.

5. Implementation Variations

- The rotation of students from station to station appeared to be more flexible and better managed than at the beginning of the year. According to information from the aides, the time in half the sites was monitored so that the students spent about 15 minutes at the computer and 15 to 20 minutes at the Typing/Writing Station. In five schools, the amount of time was flexible. At the other three schools, the students' time on the computers was monitored, but not their time at the writing station.

- Only two of the 73 responding teachers reported that they chose to not use the tapes with the Work Journal. A greater number than this were mentioned in informal conversations with the aides at the beginning of the year.

- In terms of who directed the students to the different activities each day, six aides reported that the classroom teachers did, four reported that both they and the classroom teachers did, and the other six reported that this procedure differed from teacher to teacher.

- With regard to who kept track of the students' progress charts on the back of the work journals, seven aides reported that they did this task, six reported that the teachers did the task, and three reported that in their schools both they and the teachers kept track of this information.

- It is difficult to estimate the amount of communication and coordination that occurred between the teachers and the aides. Half the aides reported that they spoke to each of the WTR teachers about WTR activities almost every day, and two reported doing this about once a week. Six of the aides, however, reported that the amount of communication between the WTR teachers and themselves differed greatly from teacher to teacher.

- A much stronger link between the writing and typing stations was observed at the end of the year compared to the beginning.

- The WTR coordinator mentioned that even though she encouraged and assisted teachers in the use of Primary Editor, which allows the storage and printing of the students' stories, some teachers by April were still not comfortable with using it. According to information from the teacher questionnaire, about 74 percent of the teachers used Primary Editor with most or all of their students, while about 19 percent of the teachers used Primary Editor with fewer than half he students in their class. Kindergarten teachers tended to use Primary Editor less often than the first- and second-grade teachers.

- In at least two or three of the WTR schools, the Instructional Specialist was very involved in the WTR Program. At one school, this resource person monitored the activities in the lab to insure that all was implemented as it was intended. Throughout the year, the teachers met regularly as a group to discuss strategies, problems, and the students' progress, and to generally share ideas.

6. Time-on-Task

- The time schedules reported at the beginning of the year generally did not change.
- At some schools, students who had attended the WTR lab in the afternoon during the first semester were changed to the morning schedule for the second semester.

- Management generally improved, thereby reducing some of the wasted time that had been used for management tasks early in the year.

- The amount of time that the WTR lab was used during the day ranged from 4 hours in two schools to 7 hours in another two schools. In seven of the schools, there were students using the lab for 5 to 5 and 1/2 hours, and in the other five schools, the lab was used for 6 hours.

- In all 11 classrooms observed, the vast majority of the students were on task.

7. Training

- During the summer prior to the implementation of the program, a two-day training session was provided to the teachers and other staff who would be working with the WTR program. Follow-up sesssions were provided throughout the school year for answering questions, making materials to use in the program, and visiting other WTR schools.

- In addition to the group training sessions, the WTR coordinator, as well as an IBM consultant and other FWISD personnel, visited the WTR classrooms on a regular basis to make suggestions and model various strategies. This on-site training was designed to provide individual teachers with whatever assistance they particularly needed.

- At each follow-up training session, the participants were asked to list other types of training that they needed or wanted.

- Despite this attention to training needs, seven (about 10 percent) of the responding teachers mentioned the need for more inservice training to help prepare teachers at the beginning of the school year.

- The WTR coordinator mentioned that the teachers could benefit from training in writing process instruction (which is described in some detail in the section regarding the writing assessment study). She reported that many of the teachers did not have a clear concept of how to utilize what the students had learned toward enhancing their writing skills. In other words, when a given student was at, for example, the level of writing a list of words, the teachers did not know how to provide appropriate guidance toward helping that child to the next level of writing sentences. Some of the teachers felt that this development would happen naturally, rather than as a direct result of teacher instruction. This was obviously not provided as a regular part of the IBM training.

8. Philosophy

. Both the teachers and the aides were asked if they felt comfortable with the phonetic spelling system used in WTR. Of the 15 aides who responded to this question, 12 reported that they did feel comfortable, while 3 reported that they were not sure. Of the responding teachers, about 86 percent reported feeling comfortable with it, about 10 percent were unsure, and about 4 percent reported not feeling comfortable with it.

. In 10 of the 11 classrooms observed, teachers and/or aides were observed helping students sound out words.

. When asked how WTR affected the rest of their curriculum, about 78 percent of the responding teachers felt that WTR enhanced the rest of the curriculum, about 13 percent felt that the rest of the curriculum remained mostly unaffected, and about 5 percent felt that WTR interfered with the rest of the curriculum. Two teachers did not respond to this question. A slightly larger percentage of kindergarten teachers than first- and second-grade teachers felt that WTR enhanced their curriculum.

. Due to time limitations, the evaluators were unable to observe during the classroom (non-lab) period to determine whether the amount of reinforcement of the WTR strategies in the classroom had increased since the beginning of the year.

9. Parent Involvement

. Nine of the 15 responding principals reported that there was a parent orientation meeting for the WTR Program.

. Ten of the 15 responding principals reported that some parents visited the WTR lab during the year.

. In terms of the number of parent volunteers who helped in the lab, the response from the principals disagreed somewhat from the response from the aides. Eight aides reported that there were parent volunteers in the lab at some time during the year: one parent volunteer in five of the schools, two volunteers in one school, three volunteers in one school, and as many as eight parent volunteers on an irregular basis in one school. Only five of the principals reported the involvement of parents at this level.

10. Summary

. Overall, the teachers, principals, and aides were very excited about the program and felt that it holds a great deal of promise.

. The staff was generally much more comfortable with the program at the end than at the beginning of the year.

. There were numerous equipment problems.

- The teachers felt that the greatest need was for more materials, both for the older students who needed more challenge and for the younger students who needed more preparation.

- The teachers felt that they needed more and better preparation, particularly at the beginning of the year.

- The teachers felt that the program might be better for some students than for others. The tendency seemed to be that the program might work best if started later in the year for kindergarteners who are not ready or at the beginning of first grade.

HOW EFFECTIVE WAS THE WTR PROGRAM IN THE DEVELOPMENT OF STUDENTS' WRITING SKILLS, IN COMPARISON TO STUDENTS OF SIMILAR SOCIOECONOMIC STATUS IN OTHER TYPES OF CLASSROOMS?

Design of the Study. Two types of comparisons were conducted to address the effectiveness of WTR in the area of writing skills. The first compared the writing skills of WTR participants with those of students of the same grade level in traditional classrooms. The second comparison was between the writing skills of WTR participants and those of students whose teachers have been trained in Writing Process (Graves, 1981,1983).

The comparison between the writing skills of WTR participants and Writing Process (WP) participants was chosen because WP is a less expensive alternative that is also aimed at improving the writing skills of children. The only expense incurred in implementing WP in a classroom is the training of the teacher. (A 30-hour training session is the minimum required, estimated to cost approximately $32 or less per teacher.)

The philosophy behind WP is similar to that of WTR in that young children are allowed to spell phonetically, with a concern toward the quality of the content of the writing over the editorial aspects (e.g., spelling, punctuation). There are major differences between the programs, however. WP encourages a great deal of social interaction among the children and between teacher and student to help the children progress through the developmental stages of writing. In WTR, the social interaction aspect is minimal compared to the

reliance on the computer and other materials. On the other hand, WTR includes components designed to teach reading skills, while WP focuses on the development of writing skills. In both programs, students are strongly encouraged to sound out letters when attempting to write new words. A more detailed description of WP is included in Appendix C.

Unfortunately, a very limited number of teachers at the kindergarten and first-grade level had been trained in WP in FWISD at the time of this study. In fact, only one kindergarten and one first-grade teacher were identified. In order to gather more data for this comparison, the evaluation team decided to include two first-grade classrooms in Arlington I.S.D. whose teachers had previously received WP training.

Because of this limitation in the number of available early childhood WP classrooms, it was necessary to match WTR and traditional classrooms to those WP classrooms. Conducting a study with matched groups has a number of drawbacks. For one thing, due to the lack of pre-treatment measures related to the program objectives, the selection of characteristics on which to match is necessarily questionable. Even in the most idealistically perfect match between groups on a characteristic such as socioeconomic status, the researcher cannot be certain that the groups were matched on a characteristic that equated the groups with respect to the outcome measure. And in the present study, the matches on the selected characteristics were far from perfect. When comparisons are between groups that were different or unequal before the treatment, and when post-treatment differences in the dependent variable are found, one cannot determine whether these differences are a result of the treatment or due to the prior inequalities. As Cronbach (1963) points out:

> Any failure to equate the classes taking the competing courses will jeopardize the interpretation of an experiment and such failures are almost inevitable. (p.49)

Despite the problems caused by the use of non-randomly selected comparison groups, the evaluation team felt that the collection of any information relative to this comparison, no matter how limited, was preferable to no such comparison.

In addition to the one kindergarten and three first-grade WP classrooms each being matched to a WTR and a traditional classroom, additional WTR and traditional classrooms were selected to represent the distribution of WTR classrooms across the district. A total of 24 classrooms were selected to include in the writing assessment study: 10 WTR, 10 traditional, and 4 WP classrooms. Table 1 presents the design of the study.

The schools were matched as closely as possible on two variables: (1) socio-economic status, as determined by the percent of students on the free and reduced meal program, and (2) the percent of students classified as limited English proficient (LEP). Once the school sites were identified, individual classrooms were selected according to the following guidelines: (1) no ESL or bilingual classrooms were included, (2) the ethnic makeup of the class was matched as closely as possible for those classrooms matched to a WP classroom, and (3) the classrooms were randomly selected for the additional (unmatched to WP) comparisons. In order to match the sample group as closely as possible for the WP comparison, a traditional classroom from the same school as the WP classroom was chosen for two of the comparisons.

Because the WP teachers might be considered "self-selected," in that these were teachers who voluntarily chose to receive WP training, there was some concern that the "specialness" of these teachers might affect their students' writing scores more than the WP instruction itself. However, it would have been highly inadvisable to try to select the comparison teachers in any but a random manner. The most important consideration in this decision was the fact that any matching procedure would have reduced the generalizability of the results to only

the "best" teachers. In other words, in examining the differences between writing skills of students in WTR and those in traditional classrooms (which is the primary goal of the writing assessment study), one could not attribute any found differences to the use of the WTR Program, but rather, only to the use of the program by the best teachers. This is obviously not a very useful generalization. Only with a random selection of classrooms could one make generalizations about the program across levels of teachers. The limitations of the WP comparison are acknowledged, but to spread these limitations to the other comparison would be devastating to the study.

Table 2 presents the demographic information for those sites selected for the study. These data are based on figures from the Fall, 1985, FWISD School Profiles, and reflect schoolwide characteristics rather than the characteristics of the particular students in the study.

Collection of Writing Samples. Writing samples were collected from each of the 24 classrooms included in the study, with a total of 215 kindergarten and 270 first-grade samples collected. All samples were collected during the morning of Thursday, May 1, 1986, with the exception of two classrooms whose samples were collected on the morning of May 2, 1986.

The procedure followed for the collection of writing samples was very similar to that used in the ETS evaluation of WTR (Murphy and Appel, 1984) with one important difference. Unlike the ETS study in which the classroom teachers administered the instructions and collected the samples, outside evaluators in this study conducted the actual administration of the instructions and collection of writing samples. This procedure had several advantages over the ETS approach. All the evaluators participated in a 45-minute training session to assure some uniformity in the collection procedure. In addition, the presence of outsiders offered some assurance that the teachers in fact did not assist their students

in the writing task. (In one classroom, a teacher was observed assisting two students, whose samples were not included in the study.)

A total of 12 evaluators participated in the collection of writing samples. Each evaluator collected the writing samples in two classrooms. To avoid any systematic differences in the administration of the instructions, all but two of the evaluators were assigned to a classroom in two different treatment groups. For logistical reasons, two of the evaluators collected samples from classrooms in the same treatment groups, but both have had extensive experience with elementary students.

The instructions used to elicit the writing samples (see Appendix D) were developed by a writing consultant who had worked at ETS at the time of the original evaluation of WTR (Murphy and Appel, 1984). The instructions were very similar to those used in the ETS study. If for any reason the instructions used to obtain the writing samples were biased against any of the children because of their socioeconomic status or their language background, the effects would have been equally distributed across the treatment groups as a result of the matching design.

The instructions were followed exactly as listed in Appendix D by all evaluators with one exception: the time allowed for completing the writing task. In 10 of the classrooms, a few children took longer than the 30-minute period: children in four classes took up to 35 minutes, children in another five classrooms took up to 47 minutes, and one child took an hour and 15 minutes to complete the task. Of these 10 classrooms, five were WTR classes, two were WP classes, and three were traditional classes. Evaluators stated that they rushed a total of 17 students to finish their stories, an average of 1.8 from nine different classrooms. The approximate average amount of time that students from different treatment groups took to complete their stories is listed in Table 3.

The evaluators were asked to describe the students' responses to the writing assignment. Overall, the response was as expected, with WTR and WP students excited and comfortable with the task, while students in traditional classes were somewhat less excited and more confused by the task. There were some notable exceptions to this trend, however. In two of the WTR kindergarten classes, the students acted as if they did not know what to do, and in three of the traditional first-grade classes, the students were quite excited and obviously experienced in creative writing tasks. In addition, the teacher's response in one traditional kindergarten class was fascinating: she said that she had never asked her students to write stories and was shocked to see that they could. When the evaluator asked the students to read their stories to her, the teacher thanked the evaluator because the teacher felt she herself would not have been able to decode their phonetic spelling.

The role of the classroom teacher during the writing assignment varied somewhat. All the teachers were asked to remain in the classroom during this time and to write the lead sentence on the board. Beyond that, the teachers chose different levels of involvement within our guidelines: some just did work at their desks, some helped pass out writing paper, some answered questions, some walked around the room offering encouragement to the students. There was no discernable trend in the teachers' behavior according to treatment group or age of student. Of the 24 classrooms, three had substitute teachers that day: one first-grade traditional and two first-grade WTR classrooms.

The role of the evaluator was quite specific and is outlined in Appendix D. In addition to these written guidelines, all the evaluators were instructed to walk around the room during the writing assignment and offer appropriate encouragement. Most of the evaluators accepted completed papers before the end of the

30-minute session; two evaluators left the papers with all the students for the full 30 minutes.

Scoring of the Writing Samples. The scoring procedure utilized in this study was the same as that used in the ETS evaluation of WTR (Murphy and Appel, 1984). This approach is somewhat holistic in nature, but allows for the decoding of individual words which are spelled phonetically. Overall, the scoring criteria do not include penmanship, spelling, grammar, or punctuation. Rather, the criteria address aspects such as the development and organization of ideas, and other standards reasonable to apply to the writing of young children.

A team of four people (a writing consultant who worked at ETS at the time of the WTR evaluation, a FWISD writing expert, and two FWISD evaluators with extensive early childhood experience) reviewed the writing samples to establish the criteria for scoring, without knowledge of each sample's origin. The kindergarten samples were examined separately from the first-grade samples. The review team read through all the kindergarten samples and a random group of over half the first-grade samples to establish the criteria. The process was the same for both sets. Upon reading a sample, each reviewer would decide at which level that paper might fall on a scale from zero to six. As each team member read more papers, he or she would begin to formulate a concept of what aspects of a paper would determine the level of that paper. All team members discussed their ideas throughout the process and slowly refined the criteria with team consensus. The final kindergarten scoring criteria are listed in Appendix E, and the final first-grade scoring criteria are listed in Appendix F.

Once the scoring criteria were established, the review team selected a representative writing sample for each scoring level within each grade level to serve as an illustration of that level. The example kindergarten writing

samples are included in Appendix G, and the example first-grade writing samples are in Appendix H.

Kindergarten and first-grade teachers from across the school district were solicited to be scorers of the writing samples. A letter requesting teachers' participation (see Appendix I) was sent to every kindergarten and first-grade teacher of the 45 non-Writing to Read schools. (No teacher from a school included in the study was to be a scorer. Due to timing limitations, the evaluation team did not know which WTR schools were to be included in the study at the time the letter of request for scorers was sent.) A total of 111 teachers responded to the letter. Of these, 26 were from schools included in the study and could not be scorers. Of the remaining 85, 50 were selected to participate. They were selected so as to represent as many different schools as possible and then randomly within this guideline. Of these 50, 38 actually participated in the scoring procedure, representing 25 different schools. Of the 38 scorers, 21 were kindergarten teachers and 17 were first-grade teachers. Because of the larger number of first-grade samples, six of the kindergarten teachers scored first-grade samples while the rest scored samples of the grade level they teach.

None of the scorers knew the exact purpose of the activity, other than as a study of the development of writing skills of young children. After an introduction, the scorers of kindergarten samples were separated from the first-grade scorers. Each group was then trained on the scoring procedure. Each scorer was given a copy of the set of samples selected to represent the seven different levels for that grade level (see Appendices G and H). The samples were coded so that the scores were unknown, and placed in the following order in each packet: the "6" sample, the "1" sample, the "5" sample, the "2" sample, the "4" sample, the "3" sample, and the "0" sample. The scorers were instructed to read each sample in turn and to place them in piles of "high" and "low" quality. Follow-

ing this, the scorers were asked to rate each paper with a score from zero to six, in a comparative fashion.

When the group had completed this activity, a hand count was taken to determine how the scorers rated each sample. Appendix J presents this tally of the training samples for the kindergarten scorers, and Appendix K presents this tally for the first-grade scorers. In only one case did any scorer deviate more than two points in either direction from the intended score. The level of consensus for the intended scores ranged from 62 to 94 percent for the kindergarten samples, and from 58 to 100 percent on the first-grade samples. A group discussion of the merits and limitations of each paper followed this tally.

Upon completion of this exercise, each scorer was given a folder with writing samples -- each of the 15 kindergarten scorers received a folder with 14 or 15 random writing samples, and each of the 23 first-grade scorers received a folder with 11 or 12 random samples. Each sample was coded in such a way that the treatment group and school were unknown to the scorers. The scorers were instructed to use the guidelines outlined for that grade level for scoring (see Appendices E and F) as well as the sample papers. They were told to ignore penmanship, grammar, punctuation, and spelling, and to not compare papers within the folder but rather to compare each to the guidelines and samples. For each of the groups, two members of the original review team were available to answer questions and help scorers to decode words that were spelled phonetically.

Each paper was read and scored independently by two readers. Whenever the two scores differed by three or more points, (e.g., 6-3, 5-2, 4-1), the paper was coded as "discrepant" and read by a third reader. Of the 215 kindergarten samples, 10 (or less than 5 percent) were scored discrepantly, and of the 270 first-grade papers, 20 (or 7 percent) were scored discrepantly. In both cases, this is rather high inter-rater reliability.

The final score for each sample was the sum of the scores given by the two readers. In the case of a discrepant paper that was read by a third reader, the two closest scores were used to determine the sample's final score. Thus, the range of scores for each sample was from zero to 12.

Results of the Writing Assessment. The results of the writing assessment were examined in three ways at each grade level: (1) comparing scores of students in matched WTR, WP, and traditional classrooms, (2) comparing scores of students in WTR and traditional classrooms that were not matched to Writing Process classes, and (3) comparing scores of all WTR and traditional students in the study.

The mean scores on the writing assessment for the students in the matched comparison of WTR, WP, and traditional classes are presented in Table 4. Cautions concerning this comparison must be emphasized. The matching procedure alone is problematic, as discussed in the section on the design of the study. In addition to the statistical and design problems built into this procedure, the range of demographic characteristics of the WTR schools was so limiting that some of the matches were questionable (see Table 2). A further concern is that even though the level of analysis is at the level of the student, in fact only one kindergarten class and three first-grade classes were included in each of the appropriate cells. Given the important effect that the teacher has on outcome measures such as that used here, this is a considerable limitation. In addition, two of the first-grade WP classes were in another district, and the teacher in the third WP first-grade class was out on maternity leave for eight weeks during the school year.

Because of all the limitations on these data, no tests of significance were conducted. At the kindergarten level, the trend in the data indicated that WTR students scored the highest, WP students next highest, and the students from the traditional class scored the lowest on the writing assessment. Not much weight

should be placed on these findings, however, because the comparison was based on only one classroom for each treatment, and the demographic match between the WTR class and the WP and traditional classes was poor. At the first-grade level, the students from the WTR and traditional classrooms scored about the same on the writing assessment while the WP students scored considerably higher.

Tables 5 and 6 present these data in a different format: the range and frequency of scores received by each group. In Table 5, which presents the kindergarten scores for the matched groups, the most obvious feature is the small range of scores (from zero to two) in the traditional classroom. The main difference in scores between the WTR and WP classrooms is the much larger number of samples scored "zero" in the WP than in the WTR classroom. It must be reiterated that while the kindergarten WP and traditional classrooms were from the same school and therefore well matched on demographics, the match between the kindergarten WTR and WP classroom was probably the most disparate (see Table 2), with the WTR class from a much higher socioeconomic status school than the WP and traditional classes. Therefore, it was difficult to draw any generalizations from these limited data.

Table 6, which presents the first-grade scores for the matched groups, is based on more data than at the kindergarten level. In examining the distribution of scores for the three groups, one sees that the WTR and traditional classroom distributions were essentially the same, with the majority of the scores falling in the low to middle range (from 2 to 6). The bulk of the WP distribution, on the other hand, was definitely in the upper range of scores (from 7 to 12). One must remember, however, that two of the three WP classrooms were located in a neighboring district and may not be comparable to our schools. These schools served high socioeconomic students, and they were matched to the FWISD schools that served the highest socioeconomic students available within the treatment

groups. Nevertheless, as with the kindergarten matched data, it was difficult to make any definitive statements about the first-grade matched comparisons.

The comparisons between the scores of students in WTR and in traditional classrooms not matched to WP carried fewer limitations and were more clearcut in their results. Table 7 presents the mean scores for the groups in these comparisons. Tests of significance that were applied to each comparison indicated no significant difference between the writing samples of students in WTR and those in traditional classrooms at both the kindergarten and first-grade level.

Tables 8 and 9 present these data in terms of the range and frequency of scores for each group. At the kindergarten level (Table 8), the most interesting difference between the groups was in the number of samples given a score of zero: 26 percent for the WTR students compared to 45 percent for the non-WTR students. On the other hand, 18 percent of the WTR students received a score of four or above compared to 25 percent of the non-WTR students.

In the same comparison at the first-grade level, as depicted in Table 9, very few differences were obvious. Twenty percent of the WTR students received a score of zero on the writing assessment compared to five percent of the non-WTR students. Other than that, the distributions were very similar.

In the third overall comparison, the scores for all the WTR students in the study were compared to the scores for all the students from traditional classrooms in the study. In other words, this comparison combined the students from the first two overall comparisons, but eliminated the students from the WP classrooms in the comparison. Table 10 presents the means and standard deviations for this comparison.

A test of significance at the kindergarten level indicated a significant difference between the scores of WTR students and those in traditional class-

rooms. This is not surprising when one realizes that the matched WTR score was the highest of all and its matched traditional score was the second lowest of all classes. These two outlier scores changed the overall complexion of the comparison considerably, but because the same limitations of non-random assignment apply, this comparison must be viewed with great caution. At the first-grade level, the difference between WTR and traditional students remained non-significant.

As the standard deviations indicated (see Table 10), there was a great deal of variance among the various classrooms included in the study, particularly at the kindergarten level. Table 11 presents the mean scores for the individual kindergarten sites, and Table 12 presents the mean scores for the individual first-grade sites. As one can see, the variance within each group was at least as large as the variance between groups, particularly at the kindergarten level. These data reinforce the cautions with which one should view the writing assessment results.

Discussion of the Writing Assessment Results. Overall, when reviewing the results of the writing assessment study, one must remember the strong limitations of the study design: a small sample size and non-randomly selected comparison groups. However, within these constraints, the results are straightforward with regard to one comparison and suggest trends on the other comparisons. The one straightforward result which was supported throughout the analyses is that there was no difference between the writing samples produced by the first-grade WTR students and those produced by the first-grade students in the traditional classes. Even within the constraints of the matched group design, assuming that there were inequalities between the groups prior to the treatment, one would strongly expect that the presence of a treatment such as WTR compared to no such treatment would produce some effect on a direct outcome measure. No such effect

was even suggested in the first-grade data. Based upon these results, in conjunction with the observations of the evaluators who collected the writing samples, one might conclude that traditional first-grade teachers may in fact be including creative writing as part of their curriculum, at least within the confines of the type of first-grade classrooms included in this study.

The data from the Writing Process classrooms at the first-grade level strongly suggested an effect from this type of instruction, compared to that used in WTR and traditional first-grade classrooms. However, the effect was strongest from the schools serving the highest socioeconomic status students, so that any generalizations were limited. Nevertheless, the data indicated that this cost-effective alternative to improving the writing skills of young children offers a great deal of promise and should be examined in greater depth.

At the kindergarten level, the only comparisons which supported the positive effect of WTR on the development of writing skills were those which included the matched classrooms in the comparison. The WTR school in this match served much higher socioeconomic status students than the school matched to it, and the resulting scores placed the students from these two schools at the two ends of the writing assessment continuum.

When these poorly matched outlier classrooms were not included in the data, the results indicated no significant differences between the writing skills of kindergarteners in the WTR program and those in traditional classrooms. However, with the wide variance within groups as well as between groups, one might conclude that the individual teacher had at least as much effect on the writing skills of his/her kindergarten students as the presence of the WTR program.

In the comparison of WP with WTR and traditional writing instruction at the kindergarten level, again only a trend was suggested. This comparison was limited to only one classroom per group and suffered from the poor match between

the WTR school and the school in which both the WP and traditional classrooms were located. However, the match between the WP and traditional classrooms, being from the same school, was as good as it could be on the population demographics. This comparison suggested a positive effect when the teacher had been trained in WP, but again, more extensive investigation is necessary before any definitive conclusion is possible.

It should be noted that the findings of this study differed from those of the ETS study of WTR (Murphy and Appel, 1984), in which differences in writing ability between WTR students and students in traditional classrooms were found. The only difference between these two studies in the implementation of the writing assessment study was in the data collection procedure: in the ETS study, the teachers themselves collected the samples, whereas in the present study, outside evaluators collected the samples. The latter procedure insured the validity of the samples.

HOW EFFECTIVE WAS THE WTR PROGRAM IN THE DEVELOPMENT OF STUDENTS' READING SKILLS, IN COMPARISON TO STUDENTS OF SIMILAR SOCIOECONOMIC STATUS IN NON-WTR CLASSROOMS?

Limitations of the Study. Just as with the writing assessment study, there were numerous limitations to the design of the reading assessment study. The validity and generalizability of the conclusions were affected by the use of a less than adequate outcome measure, the lack of pretest data, and the comparison of groups that were not randomly selected.

The outcome measure utilized in the study was the reading subtest of the Iowa Tests of Basic Skills (ITBS). This measure was considered less than adequate for several reasons. Because of the nature of a standardized norm-referenced achievement test, the items used are designed to cover a wide range of difficulty levels in order to produce a normal distribution of scores (i.e., some high, some low, most in the middle). Therefore, the items on the test are

not as representative of the objectives of a program as they are designed to produce a wide range in the scores. Additionally, the validity of the scores on standardized achievement tests tend to be questionable at the kindergarten and first-grade levels. For example, at the kindergarten level, a raw score of 24 is about at the chance level of guessing (e.g., what one would score if one randomly guessed), but this raw score yields a grade equivalent of K8, which is on grade level.

On the other hand, this is the instrument administered each spring in FWISD, and as students get older, the results of the test become more valid. Therefore, in order to compare the results from the first year of the WTR Program to later years, the use of the ITBS seemed preferable to any other measure.

A second limitation in the design of the study was the lack of pretest data. Because the decision to implement the WTR Program in FWISD was made with very little lead time prior to the beginning of the school year, it was not possible to gather any pretest data before the implementation of the program. However, at the first-grade level, the kindergarten scores from the spring, 1985, administration of the ITBS were available for some of the students.

A third limitation of the reading assessment study was the use of a matching technique to identify a comparison group in the absense of a randomly-selected treatment group. The drawbacks to this technique were outlined in the section which described the design of the writing assessment study. In short, if post-treatment differences between the comparison groups are found, one cannot be certain whether the differences are attributable to the treatment under study or to prior inequalities unrelated to the treatment. In addition, the problems in the design tend to favor the false findings of an effect where there actually was none, rather than the false finding of no effect where there actually was one.

As with the writing assessment study, the evaluation team felt that the collection of any information with regard to reading ability was better than none, and that these results should be viewed as the creation of a preliminary database for a follow-up longitudinal study.

Design of the Study. Fifteen of the WTR schools included kindergarteners in the program; kindergarteners from all 15 schools were included in the reading assessment study. Seven of the WTR schools included first-graders in the program, but first-graders in one school were excluded because they were in multi-age classrooms with second-graders. Second-graders were not included in the study because the sample size was too small.

For each WTR school in the study, a comparison non-WTR school in the district was matched to it according to the same demographic data used in the writing assessment study: (1) the percent of students on the free and reduced meal program, and (2) the percent of students who are limited English proficient. Table 13 presents the demographic information for the sites included in the study. These data were based on figures from the Fall, 1985, FWISD School Profiles. One must remember that these data applied to each school as a whole and not to the particular students included in the study.

Results of the Reading Assessment Study. Table 14 presents the Spring, 1986, mean reading scores for the kindergarteners and first-graders in the WTR and matched non-WTR schools. The difference in the reading scores between the two groups of kindergarteners was statistically significant, while the difference in the reading scores between the two groups of first-graders was not statistically significant. The limitations in the quality of the data and in the design (as discussed earlier) were particularly relevant to the kindergarten level data. At the first-grade level, the availability of "pretest" information from the previous year's administration of the ITBS made further analysis possible.

In order to examine the first-graders' scores in greater depth, the evaluation team analyzed the gains made from spring, 1985, to spring, 1986, for those first-graders who took the ITBS last year as kindergarteners. One of the six WTR schools had to be eliminated from the analysis because the reading subtest of the ITBS was not administered to kindergarteners in that school in spring, 1985. A second WTR school had to be eliminated from the analysis because it did not serve kindergarteners, and several of the first-graders came from schools that did not administer the reading section of the ITBS in spring, 1985. The two matched comparisons schools were therefore also dropped from the analysis. In addition, the sample for this analysis excluded any other first-graders who were not tested in the district last year. Table 15 presents the results of this analysis.

An analysis on these data indicated no significant difference between the two groups on the spring, 1985, kindergarten scores. A test of significance on the gain scores also yielded no significant difference between the two groups.

Discussion of the Reading Assessment Results. As discussed in the section regarding the limitations of the design, these data analyses must be viewed with caution. They suggest that kindergarteners in the WTR Program scored higher on the reading subtest of the ITBS than did students of similar socioeconomic status students in non-WTR classrooms, but that first-graders in WTR classrooms did not score higher than their comparison group. The data on the first-graders represented a smaller sample than the kindergarten data, but were more valid in that "pretest" data were available in the form of spring, 1985, test scores for a large percentage of the first-grade students. These 1985 test scores provided some support that the first-grade comparison groups were appropriately matched, while no such data were available at the kindergarten level.

These data must be viewed as the beginning of a longitudinal study. The long-range goal of the district's language arts program is to improve later school achievement, not just achievement at the early childhood level. In fact, as pointed out earlier, scores on the ITBS at the early childhood level are not particularly valid. In addition, differences between our students' achievement scores and national norms do not become apparent until after fifth grade. Therefore, any significant program effects on our students' reading abilities must be determined over a long period of time in order to be meaningful.

HOW MUCH WILL IT COST THE DISTRICT NEXT YEAR TO CONTINUE THE WTR PROGRAM AT THE SAME LEVEL OF OPERATION?

There are three areas of cost for the continuation of the WTR Program: the salaries of the full-time lab aides, the materials used in the program, and the maintenance and repair of the equipment.

Aides. The teachers were asked whether they thought the WTR Program could be operated without an aide. Their overwhelming response was that it could not: 92 percent of the responding teachers said that the lab could not be operated without an aide compared to 8 percent who thought that it could.

The WTR principals were asked what they would do if the district did not provide the additional funding for the aides next year. Four said they would reallocate personnel resources within the school to cover the lab, three would operate the program without an aide, two would do a combination of the above options, two said they did not know what they would do, two would rely on parent volunteers, one would use a minigrant, and one did not respond to the question.

It is interesting to note what strategies were used this year when the WTR lab aide was absent. In five of the 16 sites, the lab was not used. In four of the sites, someone else filled the role, such as another aide or a parent volunteer. In three of the sites, the teachers operated the lab without the

aide. In three of the sites, some of the teachers used the lab without the aide, while others did not. In the last site, someone else filled the role during part of the absent time and teachers used it without an aide during the rest of the time.

The total cost of the salaries of the 16 WTR lab aides is $169,042.

Materials. The only essential cost of materials is for the Work Journals, which, at $8.00 per student, total $18,000 for the same number of students as were in the program during the 1985-86 school year. However, a widespread concern was for more materials -- more advanced materials for the older students, more preparatory materials for the younger students, and more games, books, and manipulatives for the various non-computer stations. Depending on the needs of each site, the additional materials would increase the cost of the program accordingly.

Maintenance and Repair of Equipment. As discussed in the section regarding the physical aspects of the program, the maintenance and repair of the equipment must be considered an important component of the cost of the program. In addition to the information provided in that section which detailed the high frequency of repair record for the computers used in the program, one must also understand that this particular unit, the IBM PC jr., is no longer being manufactured by IBM. Instead, IBM will be making a new and more costly computer for use with the WTR Program. Each time a unit will be in need of major repair (which last year was 15 percent of the units), the cost of repair will be prohibitive (last year the costs, if the machines had not been under warranty, would have ranged from $315 to $1401 per unit). Therefore, under these circumstances, the district would likely choose to replace each machine of that status. At the rate of 15 percent of the units, and at an estimated cost of $1000 per unit, this would be an additional cost of approximately $19,000 per year.

The cost of repair of the units, excluding those needing major repairs, will be dependent on the type of agreement that IBM will make with the district. The FWISD Business Machine Repair Shop estimated these costs according to three possible options in the level of agreement with IBM. The estimated costs include maintenance on the additional 52 IBM PC jrs. which were distributed to various sites in May, 1986. Despite the fact that these machines were not in use during the 1985-86 school year, the warranty on them will no longer be in effect in September, 1986, because they were in the FWISD warehouse for a year.

The first option, outlined in Appendix L, represents the maintenance costs if the district chooses to make a service agreement with IBM. The total cost, quoted on June 2, 1986, opts for the lowest level of service -- carry-in service or exchange, which would require the expense of a delivery person to transport the equipment to and from Dallas in addition to the $18,194 contract.

The other two options, outlined in Appendix M, are the estimated costs if the district chooses to purchase the needed repair parts to service the equipment in the district. The Board Exchange Price Program would only be available to the district if IBM chooses to make such an agreement with the district. Otherwise, the estimated cost, based on the frequency and type of repairs needed last year, is $18,397. If IBM were to agree to allow the district to participate in the Board Exchange Price Program, the cost is estimated to be $9,898.

It should be noted that the life expectancy of each machine is five years. Therefore, with each passing year, the rate of machines which need to be replaced will likely rise above the 15 percent observed in the first year.

Budget. The total budget for the continuation of the WTR Program for the 1986-87 school year at the same level of operation, based on the above information, is estimated as follows:

Aides	169,042
Work Journals	18,000
Maintenance and Repair of Equipment (based on option 2)	18,397
Replacement of Equipment Needing Major Repair	19,000
	$224,439

In addition, there will be costs for training new teachers and aides in the program, which cannot be estimated at this time.

One further note regarding the WTR Program budget is that $6825 was spent on a software program (Listen to Learn) for all WTR sites, but this program has been inoperable due to the lack of a needed attachment part. IBM representatives claim that they will be making this part available to the district at no cost. Once this part is made available, the software program should be piloted in one or two sites to determine its utility, with consideration toward returning the unused packages if the program is unsatisfactory.

SUMMARY STATEMENTS

The following statements summarize the research findings:

1. An overwhelming majority of the participants in the Writing to Read Progam were extremely enthusiastic about the program and indicated a strong desire to continue using it.

2. Although there were many implementation problems to be ironed out at the beginning of the year, by the end of the year, the program seemed to be operating relatively close to program guidelines. However, it is unknown to what extent the WTR teachers were reinforcing the WTR philosophy and strategies in the rest of their classroom activities.

3. According to the teachers, the program may be more effective with some students than with others. Some of the kindergarteners were not ready to start the program in the fall, while some of the first-graders were bored with parts of the program.

4. There were many equipment problems, and with the warranty on the equipment ending before the next school year, the cost of repair and maintenance is a factor to be considered as a major part of next year's budget.

5. Several teachers and principals mentioned the need for additional materials, both for the older students who need more challenge and for the younger students who need more preparation. This factor is another budgetary consideration.

6. The location of the WTR Program may not have been optimal in all cases. Some WTR schools had inadequate space for the lab, and one WTR school was unable to include kindergarteners in the program.

7. Good strategies for staff training were employed throughout the year, but more and better training was mentioned as a need by some of the teachers, particularly initial training for new teachers.

8. Based on a rather limited writing assessment study, minimal differences between the writing skills of kindergarteners in WTR classes and those in traditional classes were found. No differences were found between the writing skills of first-graders in WTR classes and those in traditional classes.

9. Based on a reading assessment study that also had design limitations, kindergarteners in WTR classes scored higher on the reading subtest of the ITBS than did a comparison group, but no differences in reading scores were found at the first-grade level between WTR and non-WTR students.

10. The projected budget for the continuation of the WTR Program for the 1986-87 school year at the same level of operation as in 1985-1986 is estimated to be almost $225,000.

SPECIFIC RECOMMENDATIONS

The following recommendations stem directly from the research summary statements:

1. Continue the program at the current level of operation. Plan to evaluate the program again next year and to follow up the first-year WTR participants and their comparison groups.

2. Provide training to assist WTR teachers in the reinforcement of the WTR philosophy and strategies in the rest of their classroom activities.

3. Develop a pre-assessment to determine a student's readiness for the program. Implement the program only when students have demonstrated mastery of the appropriate pre-requisite skills. For those students who are advanced in their development, determine the appropriate cycle of the program at which they should start, by administering the mastery tests which accompany the program. Investigate the use of various classroom management techniques that would allow for the differing needs of students, for example, arranging at certain times for some students to go to the lab with the aide while the others remain with the teacher in the classroom.

4. Arrange for WTR teachers and aides to receive a 30-minute workshop from staff of the FWISD Business Machine Repair Shop designed to teach them how to diagnose minor problems with the equipment.

5. Gather as much information as possible about supplementary materials that might help meet the needs of older students who need more challenge and younger students who need more preparation. Have the materials piloted by a few teachers to determine their effectiveness prior to any major purchases.

6. Move the location of the WTR lab from school #26 (which has no kindergarteners) to school #71 (which is the early childhood center that feeds into #26). Seriously consider moving the lab from the schools with inadequate space (for example, school #81) to those that have more appropriate space.

7. Insure that new teachers and aides receive in-depth and practical training prior to their use of the lab. Expand the training of all teachers to

include more modeling of excellent teaching strategies in and out of the WTR lab. Investigate training resources available from IBM.

8. Because no differences were found in reading or writing skills between WTR and traditional students at the first-grade level, strongly consider limiting the WTR program to only the kindergarten level. This would involve identifying schools which have a large enough kindergarten population to optimally use the lab with only this age student.

9. Plan to conduct a longitudinal study to compare the long-term reading achievement of students in WTR classes with those in traditional classes. Identify more kindergarten and first-grade teachers who use writing process instruction in order to expand the writing assessment study.

10. Work with the WTR principals to identify alternative funding sources and flexible staffing patterns in order to transfer fiscal responsibility of the program to the individual WTR site managers.

OVERALL DISCUSSION

WTR is clearly an exciting although very expensive program. The participants were generally very positive about the program. Of course, one must remember that for one hour each day, the pupil-teacher ratio was cut in half, as a result of the addition of the aide. It is difficult to assess the relative contribution made by the additional staff and by the various components of the program. In addition, one must note that the program does not appear to be complete in its initial form. If supplementary software and materials must be regularly purchased to meet the varying needs of different groups of students, then the integrity of the program in meeting its objectives is not intact.

Unfortunately, because of a lack of planning and research that preceded the introduction of the WTR Program into FWISD, it was virtually impossible to

validly assess the effectiveness of the program in its first year of implementation. The program was implemented without any consideration of other more cost-effective alternatives designed to meet the same objectives, without a design that would allow for assessment of the relative contribution of WTR in comparison to competing programs, and without concern regarding how this program would impact the long-term goals of the entire K-12 continuum.

Prior to the initial implementation of any innovative program such as WTR, decision-makers must take several steps. The first and foremost is to identify the major weakness in the current district program and to formulate goals based on this identified weakness. One's use of limited resources must be guided by specific objectives and aimed at testing several equally promising options in a comparative fashion. Otherwise, a decision-maker could only know at best if an innovation is better than the current program, but surely any large expenditure should bring about some improvement as compared to no expenditure. As with Chapter I programs, educators expect the use of additional monies to improve achievement over what is found in the regular program. But if educators are going to spend additional monies on some program, they need to investigate all the options in order to find the best.

Given this perspective, the findings of this first year evaluation of WTR were rather disappointing. One would expect an expenditure as large as the one made for the implementation of this program in just 16 sites to have a tremendous impact on all areas it purports to affect. In fact, however, the only clear impact was on the attitudes and beliefs of the participants -- teachers, principals, and aides all felt very strong positive feelings about the program. And the students generally seemed to enjoy the experience. These effects are in no way trivial. But the participants were comparing a novel and exciting experiment to an approach that is essentially old and boring. It is not surprising that

WTR provided a strong "shot in the arm" for educators seeking a new and better way to teach our students.

In comparison to this strong impact on the participants' attitudes and beliefs, the WTR Program seemed to have had a rather weak impact on the outcome measures toward which it was geared: reading and writing. In addition, the problems in the design would tend to favor the false finding of an effect where there actually was none, rather than the false finding of no effect where there actually was one.

Certainly, all involved in this endeavor expected to find a large difference between the writing skills of WTR students and those of non-WTR students. In analyzing the lack of such findings, one must consider that one or both of the following phenomena may be occurring: (1) kindergarten and first-grade students in traditional classes may actually be better writers than anyone expected, given the general lack of writing instruction at this level, and/or (2) traditional kindergarten and first-grade teachers may actually be teaching more creative writing than was previously thought. On the other hand, perhaps the design itself was too inadequate to detect any real differences.

The comparison of writing skills of students in Writing Process classrooms to those of students in WTR classrooms was an attempt to illustrate a comparative investigation of the effectiveness of the WTR innovation. It represents at a very small level what should be done in the future to appropriately evaluate any new program in the district -- to identify, pilot, and compare the effects of more than one innovative technique designed to meet the same objectives. Unfortunately, the comparison between the WP approach and the WTR Program will be confounded in future years, due to the training of several select WTR teachers in the use of WP instruction during the summer of 1986.

The collection of reading scores must be viewed as entirely preliminary to a longitudinal study. Our goal in the district is to increase overall student achievement. Whether or not WTR, or any other early childhood program, is effective in meeting this goal is a question that cannot be answered until several years after the first year of implementation. However, as with the objective of improved writing skills, the goal of improved reading skills must be examined in a broader context. There are several innovative reading programs on the market, and most of them would provide greater continuity from kindergarten through the later school years than does the WTR Program. One example is the Open Court program, which, in conjunction with other components, was found to be highly effective over a period of four years with low-achieving students in Corpus Christi (Naron and Kyle, 1986).

The concept of simultaneously exploring the effects of different programs is not new. This strategy was first employed on a large-scale basis in the planned variation model of Project Follow-Through (Abt Associates, 1976). The reasoning behind this model is that, rather than implementing one single program in many different sites, one implements several competing programs or several competing versions of one program, in order to explore the effects of different approaches with the same objectives. Employing this kind of strategy gives decision-makers a great deal of information regarding which combinations of different elements produce the desired effects. Using the information gained from such exploration, decision-makers can then implement the most cost-effective program across multiple sites.

OVERALL RECOMMENDATIONS

1. Examine the overall goals and objectives of the district's K-12 language arts curriculum, in order to identify the weak areas and to set priorities appropriately.

2. Conduct a thorough investigation of available language arts programs to identify those which meet the district's needs and appear promising based on their use with students similar to those in FWISD.

3. Pilot as many alternatives as is feasible, using a planned variation design which will allow for meaningful evaluation of each program's cost-effectiveness.

4. Do not expand the use of the WTR Program until its cost-effectiveness can be compared to that of alternative programs designed to meet the same objectives.

5. Consistent with the concept of site-based management, transfer the fiscal responsibility of the program from central administration to individual school managers. This would in turn free up the use of those discretionary funds for piloting other promising alternative programs.

References

Abt Associates. (1976). Education as experimentation: A planned variation model. Cambridge, Mass.: Abt Associates, Inc. Also issued as The Follow Through planned variation experiment. U. S. Office of Education, 1977.

Cronbach, L. (1963). Course improvement through evaluation. Teachers College Record, Vol. 64.

Emig, J. (1971). The composing processes of twelfth graders. Urbana, IL: National Council of Teachers of English.

Graves, D. H. (1981). A case study observing the development of primary children's composing, spelling, and motor behaviors during the writing process. Final Report (NIE Grant No. G-78-0174). Durham, New Hampshire: University of New Hampshire. (ED 218 653)

Graves, D. H. (1983). Writing: Children and teachers at work. Exeter, New Hampshire: Heinemann.

Murphy, R. T., & Appel, L. R. (1984). Evaluation of the Writing to Read Instructional System: Second year report. Princeton, New Jersey: Educational Testing Service.

Naron, N. K. & Kyle, K. (1986). An evaluation of an effective schools approach to equality of educational opportunity. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

TABLES

Table 1

Number of Classrooms from Each Treatment Group Selected for the Study

	Writing to Read	Writing Process	Traditional
Kindergarten	5	1	5
First-Grade	5	3	5

Table 2

Demographic Description of the Schools Included in the Writing Assessment Study

	Writing to Read			Writing Process			Traditional		
		FRM[a]	LEP[b]		FRM	LEP		FRM	LEP
KINDERGARTEN	Site 1 :	26	12	Site 2[c]:	59	21	Site 3[c]:	59	21
	Site 4 :	67	76				Site 5 :	77	53
	Site 6 :	85	4				Site 7 :	85	5
	Site 8 :	51	0				Site 9 :	51	1
	Site 10:	57	0				Site 11:	63	2
FIRST-GRADE	Site 12:	38	21	Site 13[d]:	57	21	Site 14[d]:	57	21
	Site 15:	24	7	Site 16 :	10	3	Site 17 :	12	2
	Site 18:	21	0	Site 19 :	3	0	Site 20 :	14	0
	Site 21:	60	27				Site 22 :	60	14
	Site 23:	81	44				Site 24 :	75	46

a) the percent of students in that school on the free and reduced meal program (FRM)

b) the percent of students in that school identified as limited English proficient (LEP)

c,d) different classrooms from the same school

Table 3

Estimated Mean Number of Minutes for Students in Different Treatment Groups to Complete their Stories

	Writing to Read	Writing Process	Traditional
Kindergarten	12.2	15	13.4
First-Grade	24	23.3	17.4

Table 4

Mean Writing Assessment Scores for Students in Classrooms Matched to Writing Process Classrooms

	Writing to Read	Writing Process	Traditional
Kindergarten	6.67 (N=21)	3.21 (N=19)	0.61 (N=18)
First-Grade	4.85 (N=53)	7.89 (N=71)	4.72 (N=64)

Table 5

Distribution of Kindergarten Writing Scores for Classrooms Matched to Writing Process Classrooms

Frequency of Scores by Treatment Group

Scores	Writing to Read (N=21)	Writing Process (N=19)	Traditional (N=18)
12	X	0	
11	X		
10	X X X X X	0	
9			
8	X X X X	0	
7	X		
6	X X	0 0	
5		0	
4	X X	0	
3	X	0 0	
2	X X	0 0	* * * *
1	X		* * *
0	X	0 0 0 0 0 0 0 0 0	* * * * * * * * * * * *

Table 6

Distribution of First-Grade Writing Scores for Classrooms Matched to Writing Process Classrooms

Frequency of Scores by Treatment Group

Scores	Writing to Read (N=53)	Writing Process (N=71)	Traditional (N=64)
12	X X	0 0 0 0 0 0 0	
11		0 0 0 0 0 0	* *
10	X X X	0 0 0 0 0 0 0 0 0 0 0 0 0	* * * *
9	X	0 0 0 0 0 0 0 0 0 0 0 0	* *
8	X X	0 0 0 0 0 0 0	* * * *
7	X X X	0 0 0 0 0 0 0 0 0 0 0 0	* * *
6	X X X X X X X X X X	0 0 0	* * * * * * * * *
5	X X X X	0 0	* * * * * * * *
4	X X X X X X X X X X X X	0 0 0	* * * * * * * *
3	X X X X X	0 0 0 0	* * * * * * *
2	X X X X X X	0 0	* * * * * * * * * *
1	X X	0 0	* *
0	X X X	0	* * * * *

Table 7

Mean Writing Assessment Scores for Students in Classrooms Not Matched to Writing Process Classrooms

	Writing to Read	Traditional
Kindergarten	2.25 (N=81)	2.00 (N=76)
First-Grade	4.13 (N=40)	4.57 (N=42)

Table 8

Distribution of Kindergarten Writing Scores for Classrooms Not Matched to Writing Process Classrooms

Frequency of Scores by Treatment Group

Scores	Writing to Read (N=81)	Traditional (N=76)
12		
11		
10	X	0
9	X	0 0
8	X X	
7	X X	0
6	X	0 0 0 0 0
5	X X X X X	0 0 0 0 0
4	X X X	0 0 0 0 0
3	X X X X X X X X X X X X X X X X	0 0 0 0 0
2	X X X X X X X X X X X X X X	0 0 0 0 0 0 0 0 0
1	X X X X X X X X X X X X X X X	0 0 0 0 0 0 0 0 0
0	X X X X X X X X X X X X X X X X X X X X	0 0 0 0 0 0 0 0 0

Table 9

Distribution of First-Grade Writing Scores for Classrooms Not Matched to Writing Process Classrooms

Frequency of Scores by Treatment Group

Scores	Writing to Read (N=40)	Traditional (N=42)
12	X	0
11	X	
10	X	
9		0
8	X X X	0 0 0 0 0
7	X X X	0 0
6	X X X X X	0 0 0 0 0 0 0
5	X X	0 0 0 0 0
4	X X X X X X X	0 0 0 0 0
3	X X	0 0 0 0
2	X X X X X X	0 0 0 0 0 0 0 0
1	X	0 0
0	X X X X X X X X	0 0

Table 10

Mean Writing Assessment Scores and Standard Deviations for All Study Participants in WTR and Traditional Classes

	Writing to Read			Traditional		
	Mean	S. D.	N	Mean	S. D.	N
Kindergarten	3.16	3.15	102	1.73	2.37	94
First-Grade	4.54	3.02	93	4.66	2.82	106

Table 11

Mean Writing Assessment Score for Each Kindergarten Site

Writing to Read		Writing Process		Traditional	
Site 1:	6.67	Site 2:	3.21	Site 3:	0.61
Site 4:	1.74			Site 5:	1.58
Site 6:	1.61			Site 7:	0.33
Site 8:	3.91			Site 9:	4.21
Site 10:	1.67			Site 11:	2.06

Table 12

Mean Writing Assessment Score for Each First-Grade Site

Writing to Read		Writing Process		Traditional	
Site 12:	6.29	Site 13:	5.00	Site 14:	5.00
Site 15:	3.94	Site 16:	8.85	Site 17:	4.53
Site 18:	4.39	Site 19:	9.04	Site 20:	4.61
Site 21:	5.19			Site 22:	5.45
Site 23:	2.95			Site 24:	3.77

Table 13

Demographic Description of the Schools in the Reading Assessment Study

	Writing to Read		Non-Writing to Read	
	FRM[a]	LEP[b]	FRM	LEP
Kindergarten	Site 1: 67	76	Site 2: 77	53
	Site 3: 38	21	Site 4: 34	23
	Site 5: 57	0	Site 6: 63	2
	Site 7: 81	44	Site 8: 75	46
	Site 9: 66	2	Site 10: 68	2
	Site 11: 26	12	Site 12: 26	7
	Site 13: 24	7	Site 14: 24	4
	Site 15: 63	3	Site 16: 50	4
	Site 17: 21	0	Site 18: 21	2
	Site 19: 51	0	Site 20: 51	1
	Site 21: 18	3	Site 22: 15	1
	Site 23: 85	4	Site 24: 85	5
	Site 25: 81	2	Site 26: 82	17
	Site 27: 55	2	Site 28: 52	2
	Site 29: 51	1	Site 30: 54	8
First Grade	Site 31: 38	21	Site 32: 34	23
	Site 33: 60	27	Site 34: 69	27
	Site 35: 81	44	Site 36: 75	46
	Site 37: 20	12	Site 38: 26	7
	Site 39: 24	7	Site 40: 24	4
	Site 41: 21	0	Site 42: 21	2

a) the percent of students in that school on the free and reduced meal program (FRM)

b) the percent of students in that school identified as limited English proficient (LEP)

Table 14

Mean ITBS Reading Scores in Spring, 1986, for Writing to Read Participants and a Matched Comparison Group of Students

	Kindergarten				First Grade			
	*RS	GE	PR	N	RS	GE	PR	N
Writing to Read	34.7	1.23	79.4	1242	46.1	2.28	62.6	363
Non-Writing to Read	31.5	1.07	72.4	1378	45.0	2.17	60.2	482

*RS = Mean Raw Score
GE = Mean Grade Equivalent
PR = Mean Percentile Rank
N = Number of Students in Group

Table 15

Matched 1985/1986 ITBS Reading Scores for First-Grade Students in Writing to Read and Non-Writing to Read Classrooms

	Sring, 1985			Spring, 1986		
	RS*	GE	PR	RS	GE	PR
Writing to Read (N=157)	32.1	1.12	76.0	49.5	2.54	68.9
Non-Writing to Read (N=230)	33.4	1.16	78.7	49.1	2.43	67.7

*RS = Mean Raw Score
GE = Mean Grade Equivalent
PR = Mean Percentile Rank

APPENDICES

Appendix A

Observation and Interview Form -
Initial Implementation

School _____ Evaluator _____

Grade Level _____ Date _____ A.M. P.M.

Writing to Read Program

Lab Observation:

1. Number of Students:_____

2. Number of lab stations:_____

   2a. Materials used at each station: _____
   (Note any differences)

   2b. Location of lab: _____

3. What was the teacher doing? _____

   _____

4. What was the aide doing? _____

5. Were the students on task? _____ Yes _____ No

   Explain _____

6. How many students were working at each station? _____

7. How were students rotated from station to station? _____

   _____

Teacher Interview:

1. Did you receive any inservice on the Writing to Read Program? Describe:

   (Length _____From Whom _____Date _____).

	No Value				Great Value
Rate the inservice training	1	2	3	4	5

2. Describe the classroom readiness procedures for your students prior to WTR participation.

   _____

3. In your opinion, does the learning of a phonemic spelling system better prepare students to learn how to read? _____Yes _____No

   Why do you think so? _____

/2

4. Do you reinforce the WTR phonetic sounds in your classroom teaching? ____Yes ____ No
   If no, why not? _____

5. How were materials gathered for the lab stations? _____

_____

6. How were students introduced to the stations? _____

_____

7. Are parents involved? If so, how? _____

8. Do you complete the class profile weekly? _____ Yes _____ No
   Are the profiles useful? _____

9. Rate the amount of paperwork/accounting?

Teachers					Principals				
Little				A Lot	Little				A Lot
1	2	3	4	5	1	2	3	4	5

10. Rate the value of WTR program for your students.

Teachers					Principals				
No Value				Great Value	No Value				Great Value
1	2	3	4	5	1	2	3	4	5

Principal Interview:

1. What grades use the lab? _____

   1a. Total number of students: _____

   1b. How long does each class stay in the lab? _____

2. Did the WTR teachers receive inservice training? _____ Yes _____ No
   Explain: _____

3. Are parents involved? If so, how? _____

4. Who is responsible for the lab when the Aide goes to lunch? _____

5. What do you do when the Aide is absent? _____

_____

Comments: _____

_____

_____

_____

_____

Appendix B

Observation Form and Questionnaires
End of Year Implementation

71

Writing to Read
Class Observation

School # _____ Evaluator _____

Teacher _____ Date _____

Grade Level _____ A.M. _____ P.M. _____

1. During the course of the lab, about how many of the students participated in the following activities?

	Most or All	About Half	Some	None or Very few
Working on instructional cycles				
Working on Silly Sentences				
Working on Computer Games				
Writing stories by hand				
Typing stories at keyboard				
Drawing pictures				
Playing games (e.g., Bingo)				
Listening to tapes with books				
Doing work journal				
Using Primary Editor				
Playing Make Words games				

2. Were the students on task? ____ Yes ____ No If no, please explain:

_____

3. What did the teacher do? _____

_____

4. What did the aide do? _____

_____

5. About how many of the students produced the following levels of writing on the computer?

	Most or All	About Half	Some	None or Very few
Only single letters				
Single words (cycle works mostly)				
Single words (not cycle words)				
Simple sentences				
Sentences that related into a story				

6. About how many of the students produced the following levels of writing by hand?

	Most or All	About Half	Some	None or Very few
Pictures only				
Single letters				
Single words (cycle words mostly)				
Single words (not cycle words)				
Simple sentences				
Sentences that related into a story				

7. Did you see the teacher and/or aide help the students sound out words?

____ Yes ____ No

8. What other kinds of help did the teacher and/or aide give the students?

_____

_____

9. Were the students given a topic or other prompt for their writing?

____ Yes ____ No If yes, please describe: _____

_____

10. Could the students read their stories to you?

____ Most ____ Some ____ Very Few

11. Did the teacher or aide monitor the performance of the students at all?

____ Yes ____ No If yes, please describe:

_____

_____

12. Did any students try to sound out words by themselves or in pairs?

____ Yes ____ No About how many? _____

13. Other Comments/Observations:

Writing to Read **Principal Questionnaire 5/86**

The Department of Research and Evaluation is conducting an evaluation of the Writing to Read Program. We would greatly appreciate your completing this short questionnaire and returning it by May 19, 1986. The return address is on the other side of this form. Just fold and staple it with the return address on the outside, and put it in the school mail. If you have any questions, call Nancy Naron at ext. 408. Thank you very much for your cooperation!

---

1. School # _____

2. About how often have you observed the activities in the WTR lab this year?
   ____ once or twice
   ____ several times
   ____ about once a month
   ____ about twice a month
   ____ about once a week
   ____ more than once a week

3. Does more than one grade level use the lab in your school? ___ Yes ___ No
   If yes, do you think it is more appropriate for one grade than another?
   ____ more appropriate for kindergarten
   ____ more appropriate for first grade
   ____ more appropriate for second grade
   ____ equally appropriate for the grades who use it in my school
   ____ not appropriate for any grades who use it in my school

4. How effective do you think the WTR program has been in teaching your students?

	Very Effective	Somewhat Effective	Not Effective
To Read:	1	2	3
To Write:	1	2	3

5. If the additional funding for the WTR lab aide were not available next year, what would you do?
   ____ operate the program without an aide
   ____ reallocate personnel resources within my school to cover the lab
   ____ discontinue the use of the lab
   ____ other (please specify: _____)

6. Was there any parent involvement in the WTR program in your school?
   ____ Yes ____ No If yes, please check all that apply:
   ____ parent orientation meeting
   ____ parent volunteers worked in lab
   ____ parents visited lab
   ____ other (please specify: _____)

7. Do you want to use the WTR program in your school next year? ___ Yes ___ No

8. What do you see as the major strength of the program? _____
   _____

9. What do you see as the major weakness of the program? _____
   _____

10. What do you plan to do with your first-graders next year who were in WTR this year? _____

11. What are your general feelings about the WTR program?

Writing to Read **Teacher Questionnaire 5/86**

The Department of Research and Evaluation is conducting an evaluation of the Writing to Read Program. We would greatly appreciate your completing this short questionnaire and returning it by May 19, 1986. The return address is on the other side of this form. Just fold and staple it with the return address on the outside, and put it in the school mail. If you have any questions, call Nancy Naron at ext. 408. Thank you very much for your cooperation!

1. School # _____

2. Grade Level: ____ Kindergarten ____ First Grade ____ Second Grade

3. Please indicate by a check in the appropriate column what percentage of your students:

	0-25 Percent	26-50 Percent	51-75 Percent	76-100 Percent
a. were not ready to begin the program in the fall				
b. found the beginning cycles too easy				
c. completed all 10 program cycles				
d. needed to repeat at least half of the 10 cycles				
e. completed all 6 Silly Sentence exercises				
f. played Cat and Mouse and Turtle and Rabbit				
g. used Primary Editor				

4. Have you had any problems with the equipment used in the program?

			Please describe problem:
headphones?	____ Yes	____ No	_____
computers?	____ Yes	____ No	_____
tape recorders?	____ Yes	____ No	_____
printer?	____ Yes	____ No	_____

5. Do you feel comfortable with teaching your students a phonetic spelling system? ____ Yes ____ No ____ Not sure

6. Did you use the tapes with the Work Journal? ____ Yes ____ No

7. What was the general reaction of your students to the repetitious nature of the instructional cycles?

____ most stayed interested
____ some stayed interested, others got bored easily
____ most got bored easily

8. How do you think the WTR program affected the rest of your curriculum?

____ WTR enhanced the rest of my curriculum
____ the rest of my curriculum remained mostly unaffected
____ WTR interfered with the rest of my curriculum

9. Do you think the WTR program could be operated without an aide? __ Yes __ No

10. Do you want to use the WTR program again next year? ___ Yes ___ No

11. What changes would you like to see made in the program?

_____

12. What are your general feelings about the WTR program? _____

_____

_____

Writing to Read **Aide Questionnaire 5/86**

The Department of Research and Evaluation is conducting an evaluation of the Writing to Read Program. We would greatly appreciate your completing this short questionnaire and returning it by May 19, 1986. The return address is on the other side of this form. Just fold and staple it with the return address on the outside, and put it in the school mail. If you have any questions, call Nancy Naron at ext. 408. Thank you very much for your cooperation!

1. School # _____

2. What is your role in the WTR lab? (Check only one)

   ____ I monitor the activities at the computers.
   ____ I monitor the activities at the computers and at the typing station.
   ____ I circulate throughout the lab and monitor all activities.
   ____ Other (please specify: _____)

3. Who decides what activities to direct the different children to do each day?

   ____ the classroom teachers do ____ the teachers and I both do
   ____ I do ____ it is different with different teachers

4. On an average, how often do you talk to each of the WTR teachers about the WTR activities? (Check only one)

   _____ rarely ____ about once a week
   _____ about once or twice a month ____ almost every day
   _____ it differs greatly from teacher to teacher

5. Is the amount of time spent at the computers and at the typing/writing station monitored? ___ yes, the children spend: ___ minutes at the computers
   ___ minutes at the typing/writing station
   ____ no, it is flexible

6. Who keeps track of the students' progress charts on the back of the Work Journals?
   ____ the teachers do ____ I do ____ no one does

7. Do you feel comfortable with the phonetic spelling system used in WTR?
   ____ Yes ____ No ____ Not sure

8. How many hours per day:
   a. are there students in the lab? ____ hours
   b. do you spend in preparation for the lab? ____ hours

9. Have there been any parents helping in the lab? ___ Yes ___ No How many? _____

10. When you have been absent this year, what has happened in the lab?

    ___ it was not used
    ___ the teachers used it without an aide
    ___ someone else filled my role (who?_____)
    ___ other (please specify: _____)

11. What problems have you encountered in the lab this year? _____

    _____

    _____

12. What are your general feelings about the WTR Program?

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Appendix C
Description of Writing Process Instruction

Writing Process is a system of writing instruction which addresses the process by which students generate content. Traditionally, writing has been viewed as product-oriented. That is, instruction in writing typically has taken place after the writing is complete. A great deal of research that has been generated over the past two decades (Emig, 1971; Graves, 1981), however, has shown that writing instruction conducted in the traditional fashion does not improve student writing.

The research has indicated that for student writing to improve, no matter the grade level, instruction must occur throughout the series of discrete stages in which writing develops: the initial drafting of a piece of discourse, peer response to first draft, revision, redrafting, editing, conferencing, the final draft, publishing, and evaluation. These activities can generally be categorized as prewriting, writing, sharing, revising, editing, and evaluating. The process is highly individualistic and recursive in nature. With the very young writer, less emphasis will be placed on the revising, editing, and evaluating stages than on the other stages.

The student/writer depends heavily on peer response to shape meaning and to address correctness. The teacher's role is that of collaborator/editor. In this way, writing process is student centered, rather than teacher centered, and a great deal of interaction occurs among the students and between student and teacher throughout the writing process.

Writing process instruction is the model being utilized and constantly expanded and improved by the National Writing Project (NWP). The first NWP site was at Berkeley, known as the Bay Area Writing Project. There are now 146 NWP sites nationwide using this model. FWISD is one of these sites and the only one located in a public school district.

Appendix D

Instructions for Collection of Writing Samples

1. Materials: Students should use the writing implements that they normally use and the Primary Writing Tablet paper that has been provided. If they do not have anything to write with, supply each with a pencil.

2. Length of Time: After the directions have been given, allow the students 30 minutes to complete their story. If they finish early, collect the sample and give those who are finished extra paper for drawing a picture.

3. Length of Response: There is no required length.

4. Teacher Assistance: Please do not assist the students in any way. If the student needs more than one sheet of paper, provide that, but do not staple the pages together until after the 30 minute period.

5. Directions: After the pencils and paper have been distributed, give the students the following directions:

   (Say) Today I'm going to ask you to write a story all by yourself. I want you to tell a story about a make believe ride in a magic car. You can do anything you want to on the ride. You can drive to the moon, or you can drive back in time to see the dinosaurs. You can drive to visit someone that you like or you can go to eat chocolate ice cream with Big Bird. You can pretend to go anywhere that you want.

   Now, I want you to write a story all by yourself about what you would do if you took a ride in a magic car.

   Your teacher is going to write the beginning of the story on the board:

   (Print out this stem on the board):

   Once I took a ride in a magic car.
   (Read this sentence aloud to the children.)

   (Say) Now you write the rest of the story yourself. Try it!

6. Special Circumstances:

   a) If any children ask you to repeat the directions, or say they do not know what to do, repeat the last sentence of the prompt:

   "I want you to write a story all by yourself about what you would do if you took a ride in a magic car."

If any children ask if they can draw a picture, say:

"That's o.k., but we'd like you to write a story too if you can."

c) If any child becomes <u>visibly</u> upset by the task, you may go to that individual child and say quietly:

"It's o.k. to draw a picture with your story if you want to."

d) If any children ask for help from other students or the teacher, say:

"Try to do it by yourself."

7. <u>Concluding the assessment</u>: At the end of the 30 minute period, take up all papers. If the student has used more than one sheet, staple the sheets together. Staple the index card with the code facing down at the same time. Put the staple at an angle in the top left hand corner. Thank the children and the teacher for their time and cooperation!

Appendix E

Kindergarten Scoring Criteria

Level 6

The writer clearly conveys a narrative account through vivid or striking word choice. The writer may also indicate an awareness of the cause and effect relationship of events.

Level 5

The writer conveys a narrative account through clear word choice.

Level 4

The writer conveys an event or events, but these may be somewhat disjointed.

Level 3

The writer attempts to convey an event or events but often falls into a pattern of repetition or listing.

Level 2

The writer establishes a direct relationship with the stem, but little or no detail is given.

Level 1

There is some attempt to write, but there may only be one intelligible word beyond the stem.

Level 0

The stem is merely copied, or the stem is copied and a picture is drawn. Unintelligible words may follow.

Appendix F

First-Grade Scoring Criteria

Level 6

The writer clearly conveys a narrative account through vivid or striking word choice. Details are essential to the sense of a narrative.

Level 5

The writer conveys a narrative account through clear word choice. Details contribute to the sense of a narrative.

Level 4

The writer has a simplistic form of narrative, although details may be somewhat additive or repetitious.

Level 3

The writer attempts to convey a sense of story, but the story is often repetitious in its detail.

Level 2

Some details are added beyond the stem, but these may be very disjointed.

Level 1

Merely a comment or a list of words follows the stem.

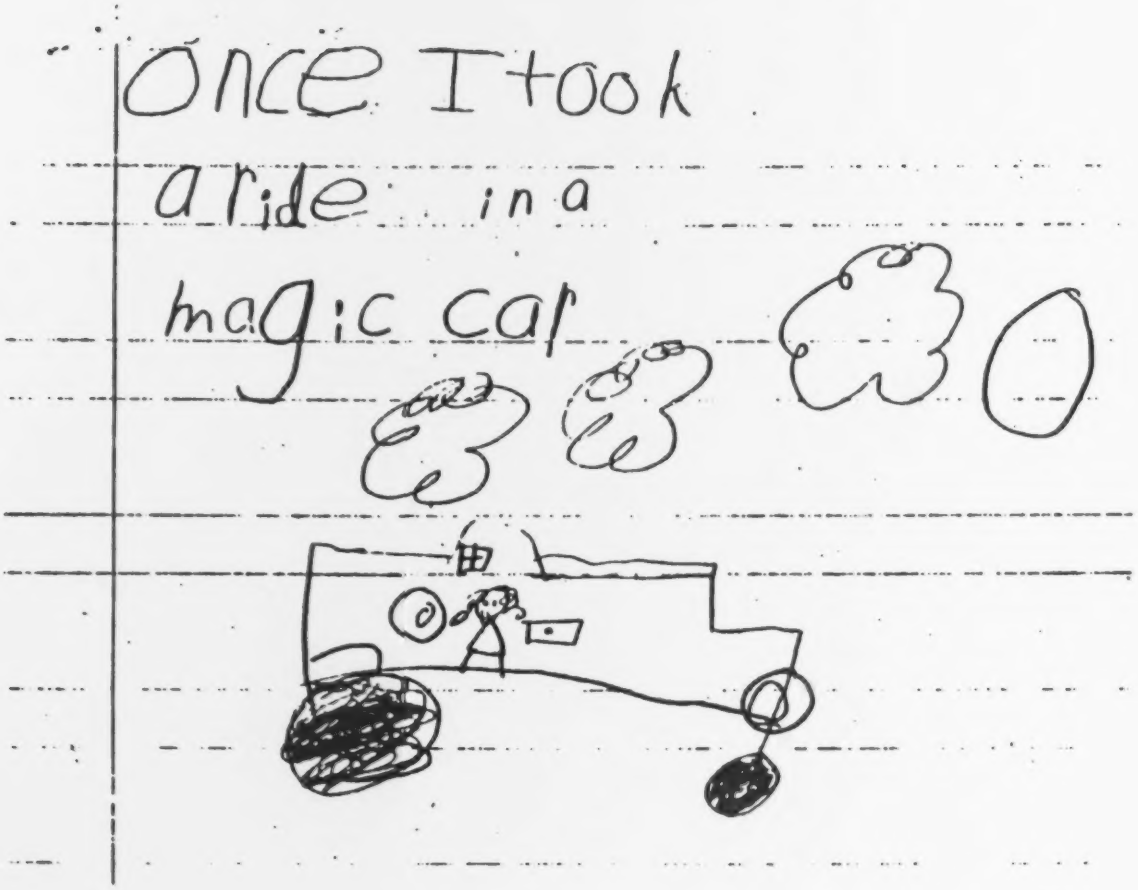
Level 0

Material following the stem does not constitute an understandable sentence.

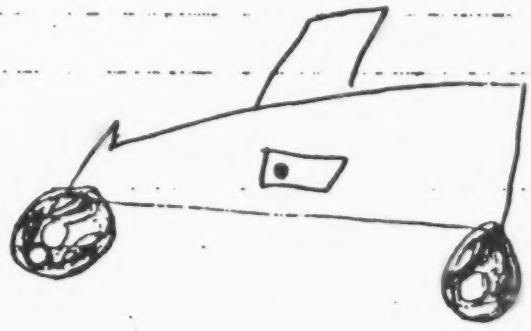
Appendix G

Examples of Kindergarten Writing Samples

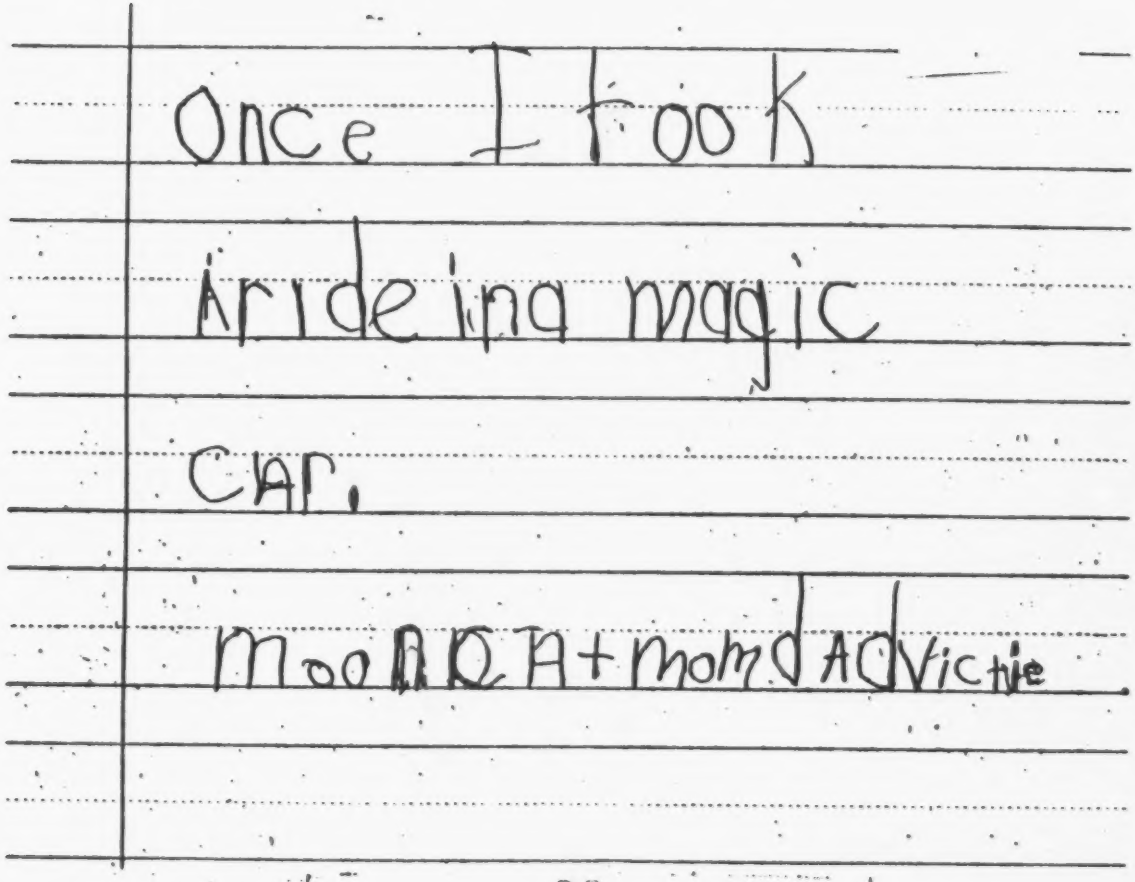
Kindergarten Writing Sample Score of 0



Once I took a ride in a magic car



Kindergarten Writing Sample Score of 1



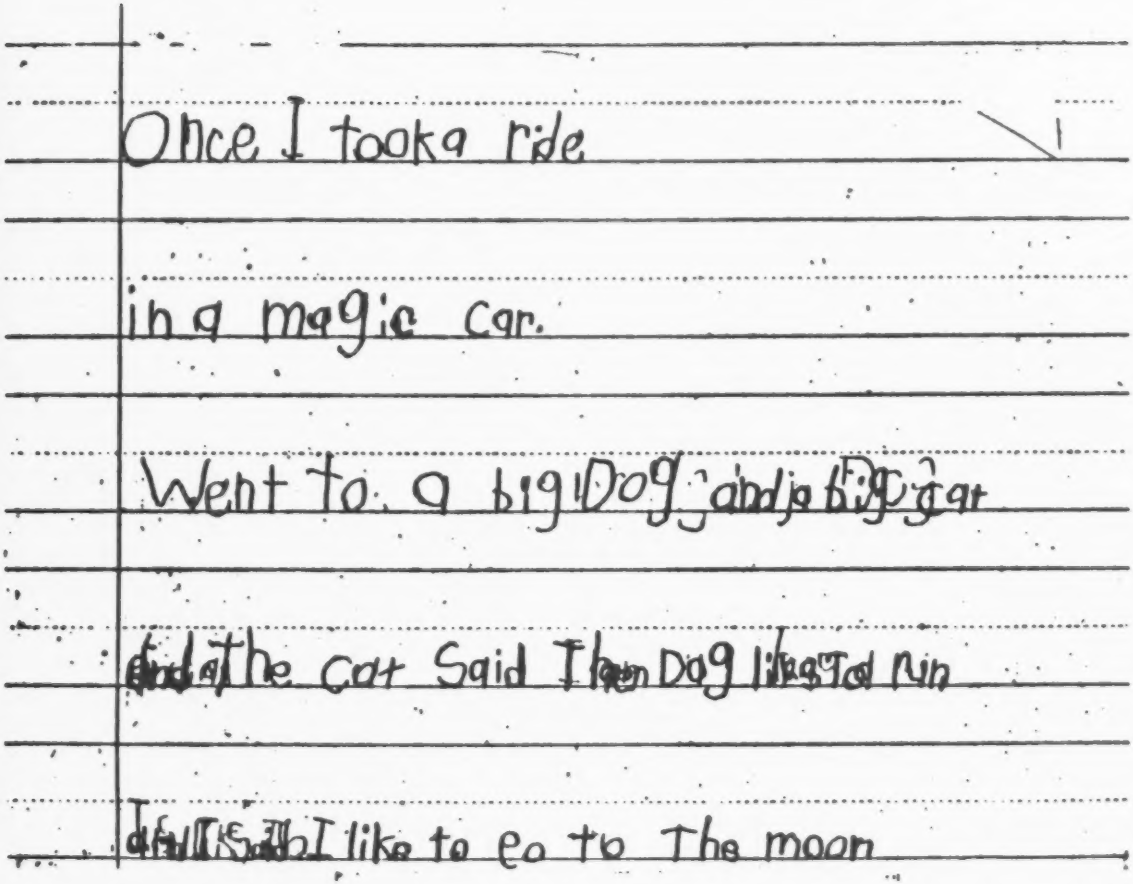
Kindergarten Writing Sample Score of 2

Once I took a ride

in a magic car

car I went to the store eat some cerral.

Kindergarten Writing Sample Score of 3



I Said I like you The cat Said I like you to

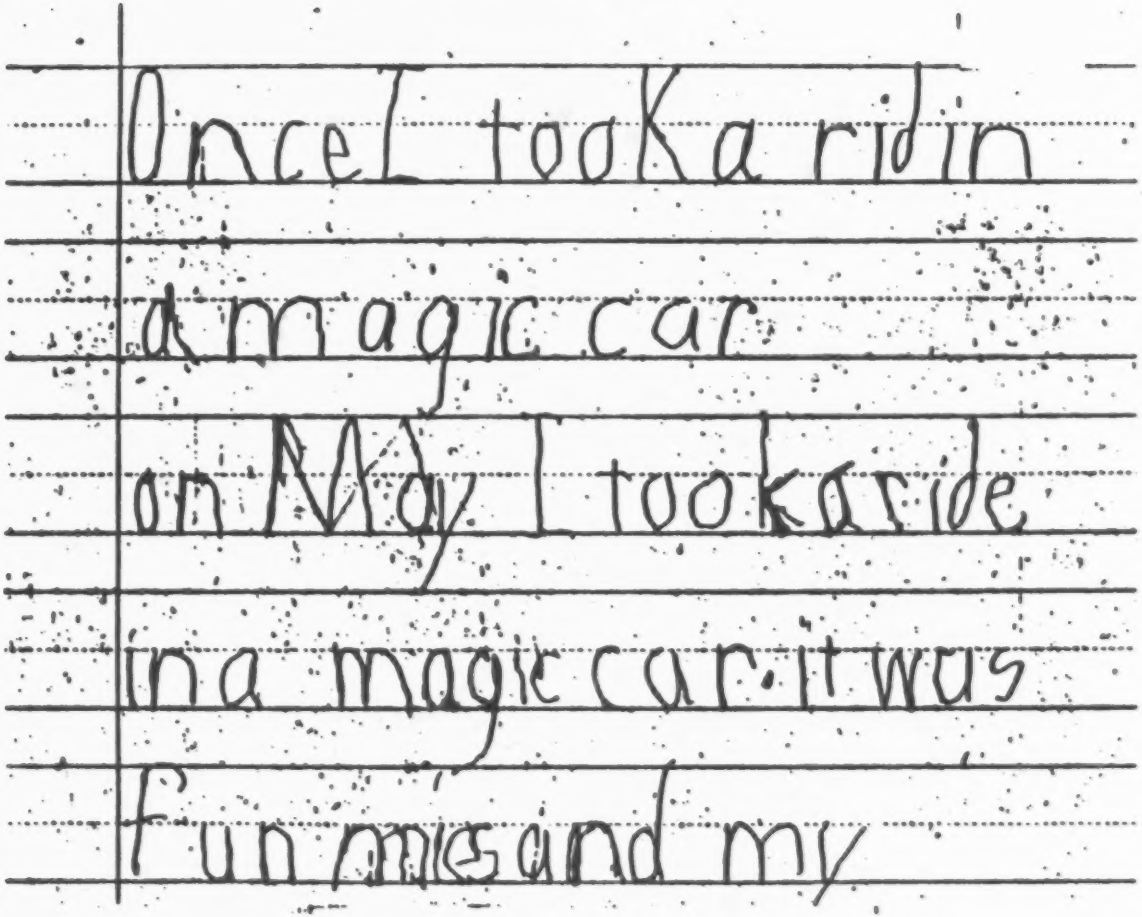
The Dog Said i like you to the Dog

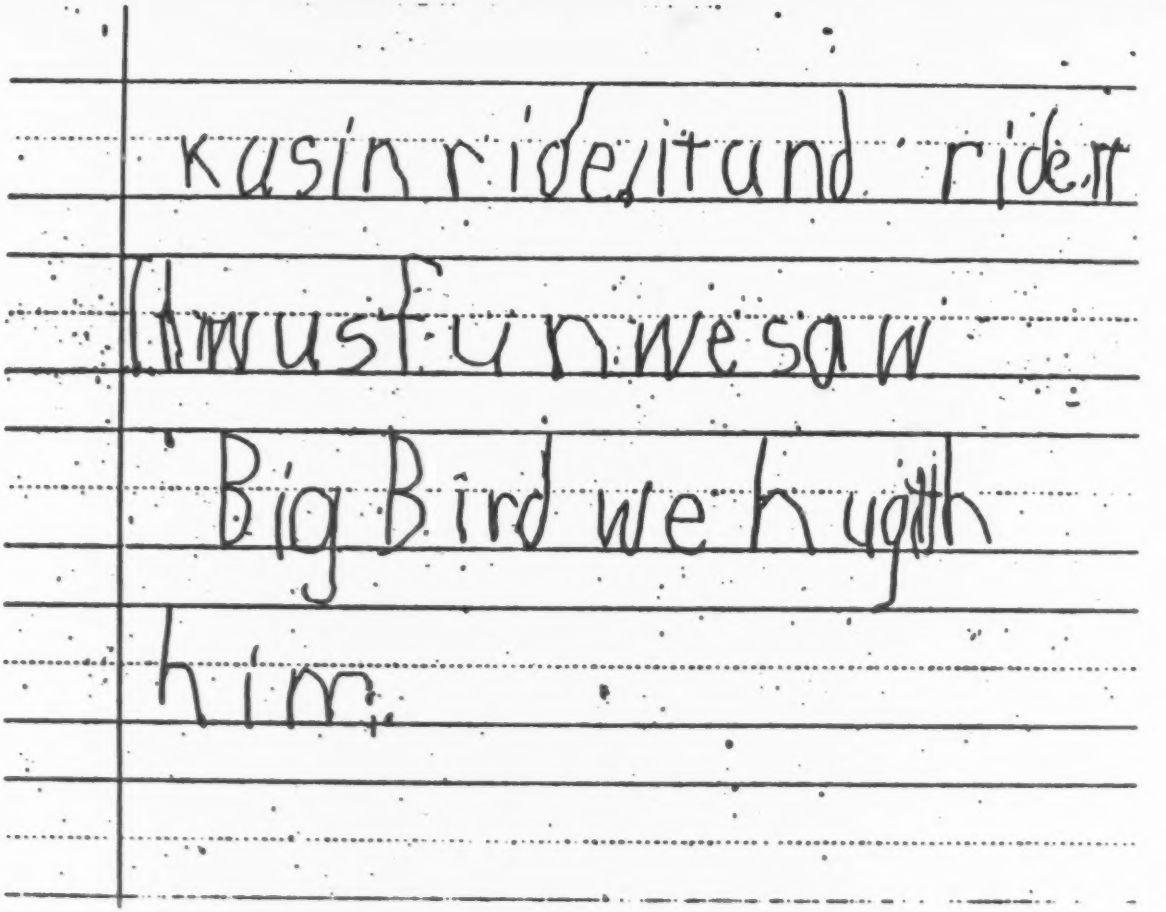
Went to The car The car Said

i like you The Dog Said I like

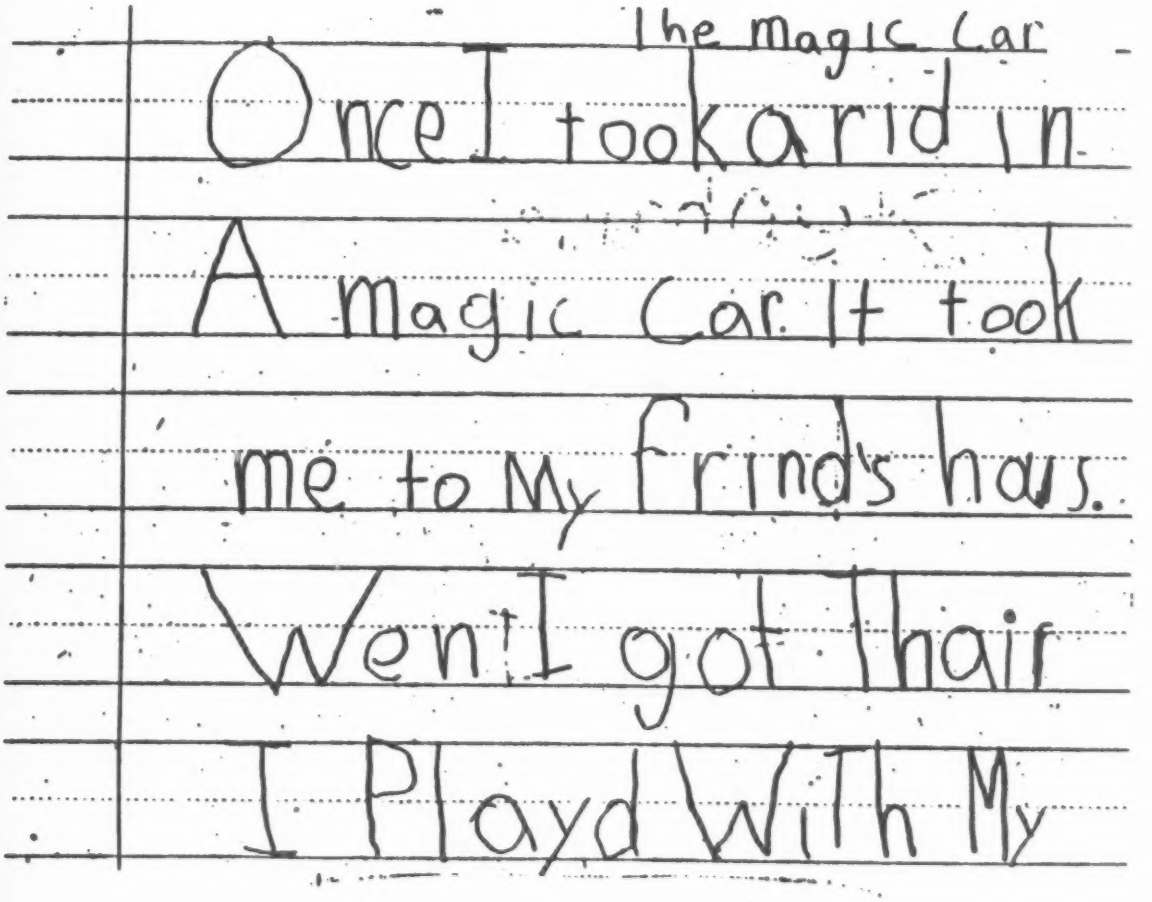
you to The Dog Said I love you.

Kindergarten Writing Sample of 4




kasin ride,it and ride.
[hwusf un we saw
Big Bird we h ugth
him.

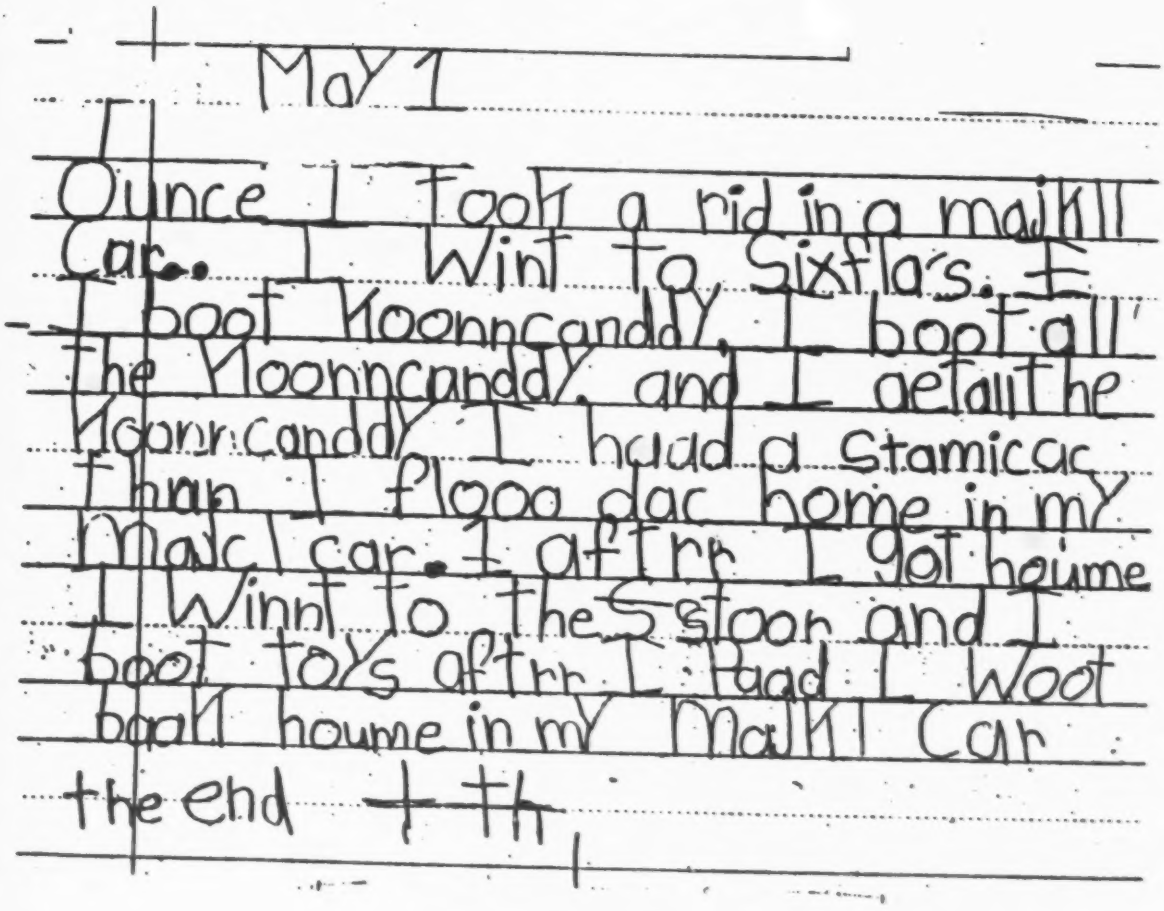
Kindergarten Writing Sample Score of 5 .



Frind in The Magic Car. The End

-May 1, 1986

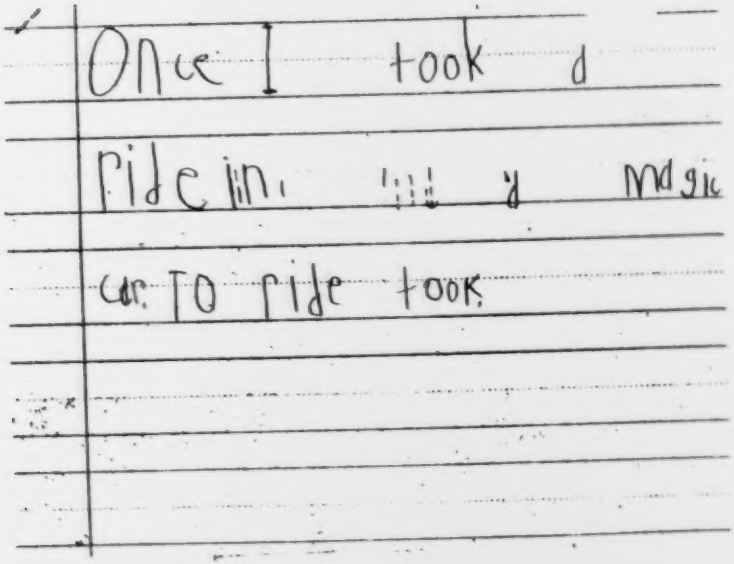
Kindergarten Writing Sample Score of 6


May 1
Ounce I took a rid in a maikll
Car. I Wint to Sixfla's. E
I boot Koonncandy. I boot all
the Koonncandy and I aetall the
Koonncandy I hadd a Stamicac
than I flood dac home in my
Mark car. I aftrr I got haime
I Winnt to the Stoon and I
boot toys aftrr I had I Woot
boall houme in my Maikl Car
the end

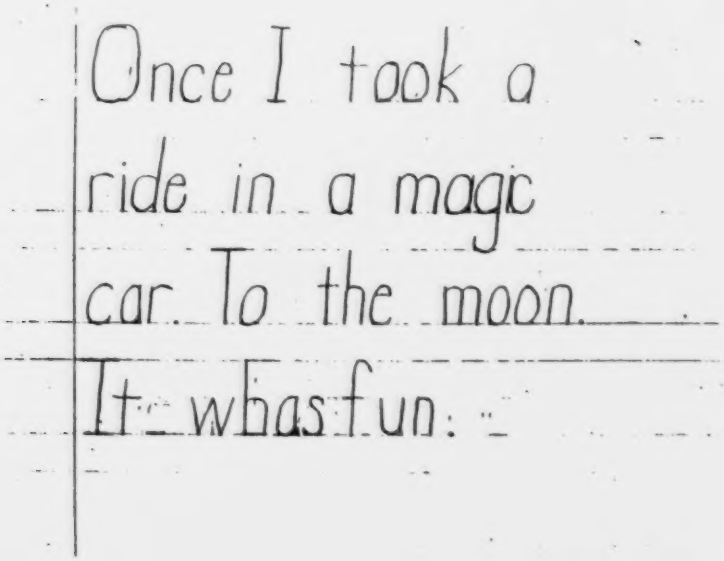
Appendix H

Examples of First-Grade Writing Samples

First-Grade Writing Sample Score of 0

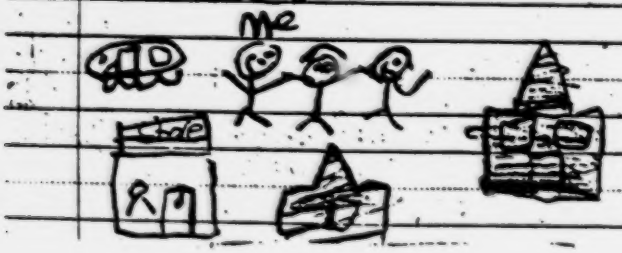


First-Grade Writing Sample Score of 1



First-Grade Writing Sample Score of 2

Once I took a ride in a magic car. I went to see my friends my friend live in a other state. Mexico is a tree.



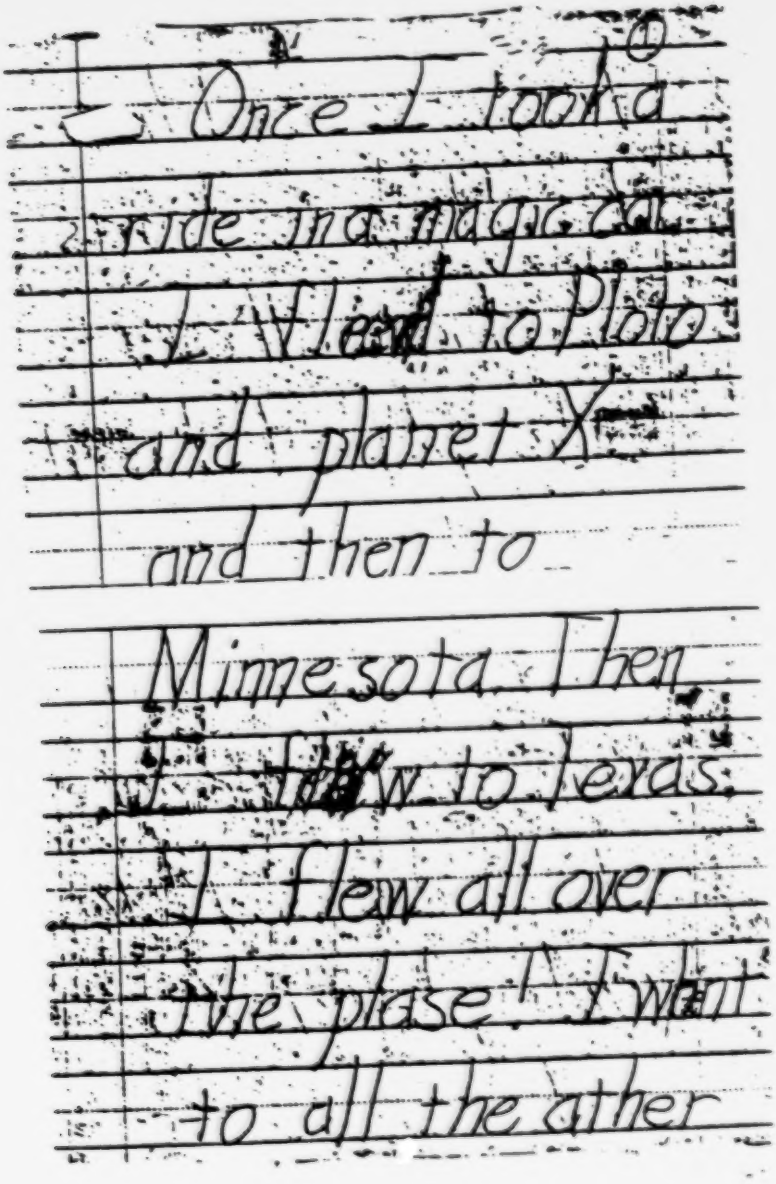
98

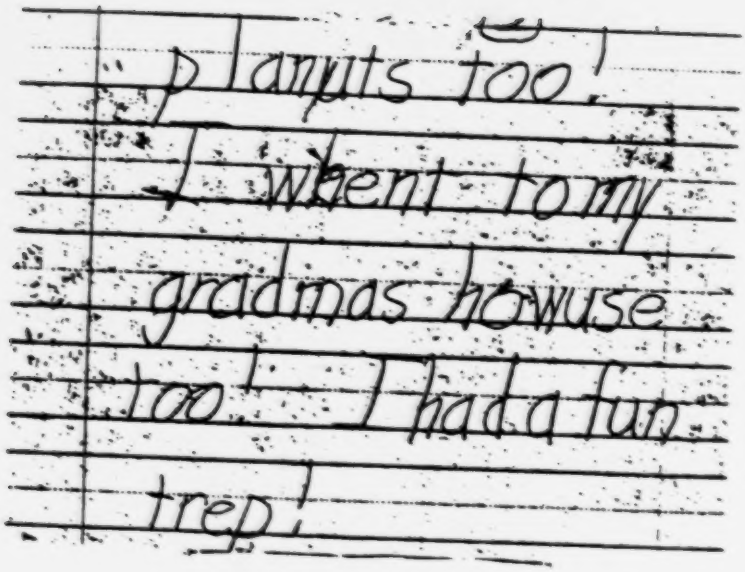
May.1,1986

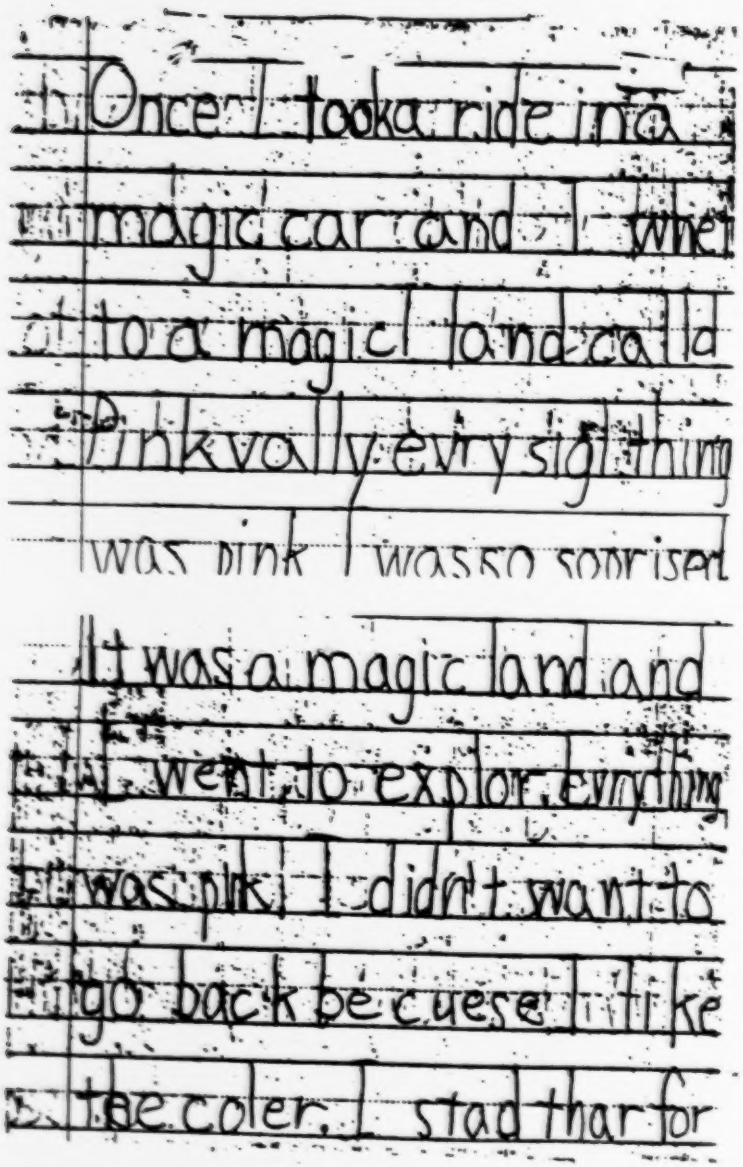
Once I took a ride
in a magic car and
I waent to BigBirds
house and we waent
to the moon and
we waent to see my
mom and we waent
to see my dad to and
we waent to see my

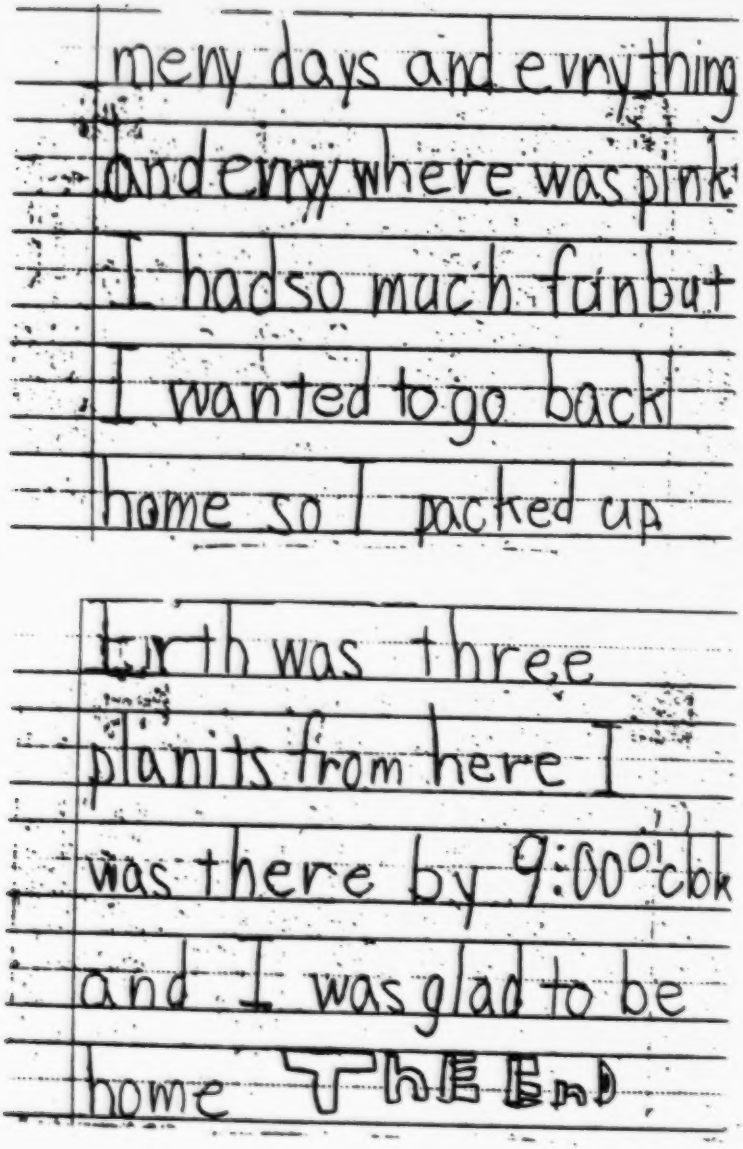
sister and we wantto
see my brother and
we waent to see
Big Birds mom and
dad and siser and

brother and we
waent to get some
icecrem and we
had fun.
The. End.


Once I took a
ride in a magic cat.
I flew to Pluto
and planet X
and then to
Mimesota. Then
I flew to Texas.
I flew all over
the plase. I went
to all the ather

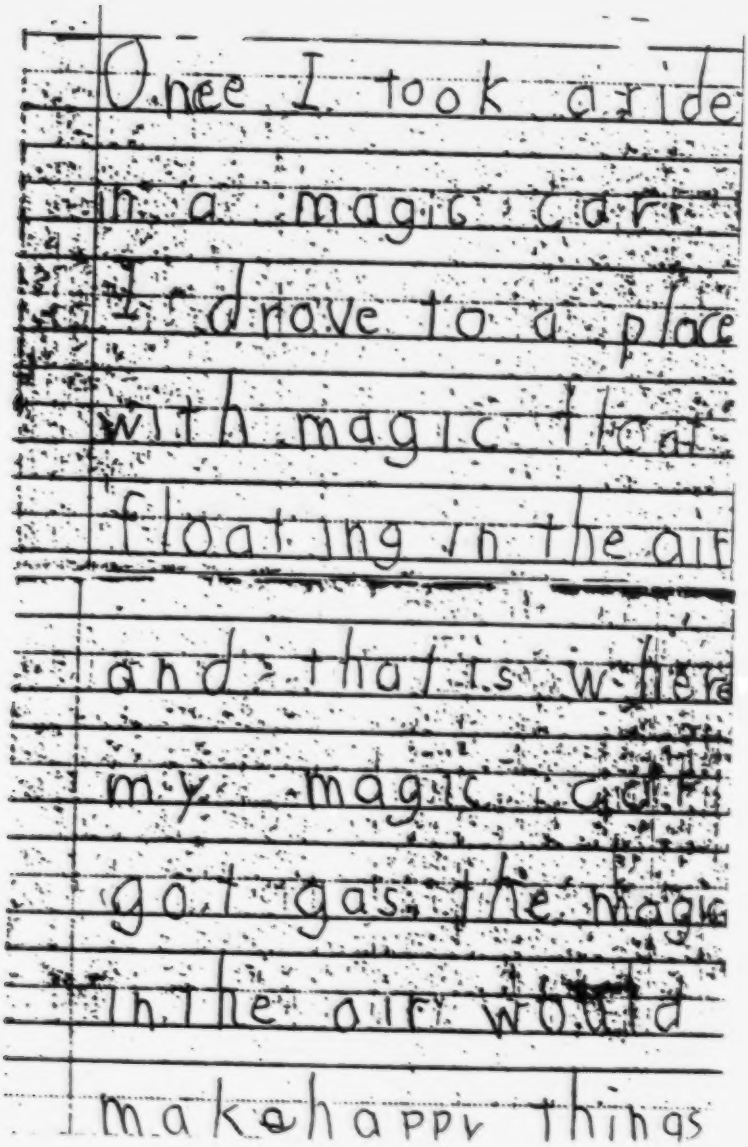

I anjts too!
I went to my
gradmas howuse
too! I had a fun
trep!

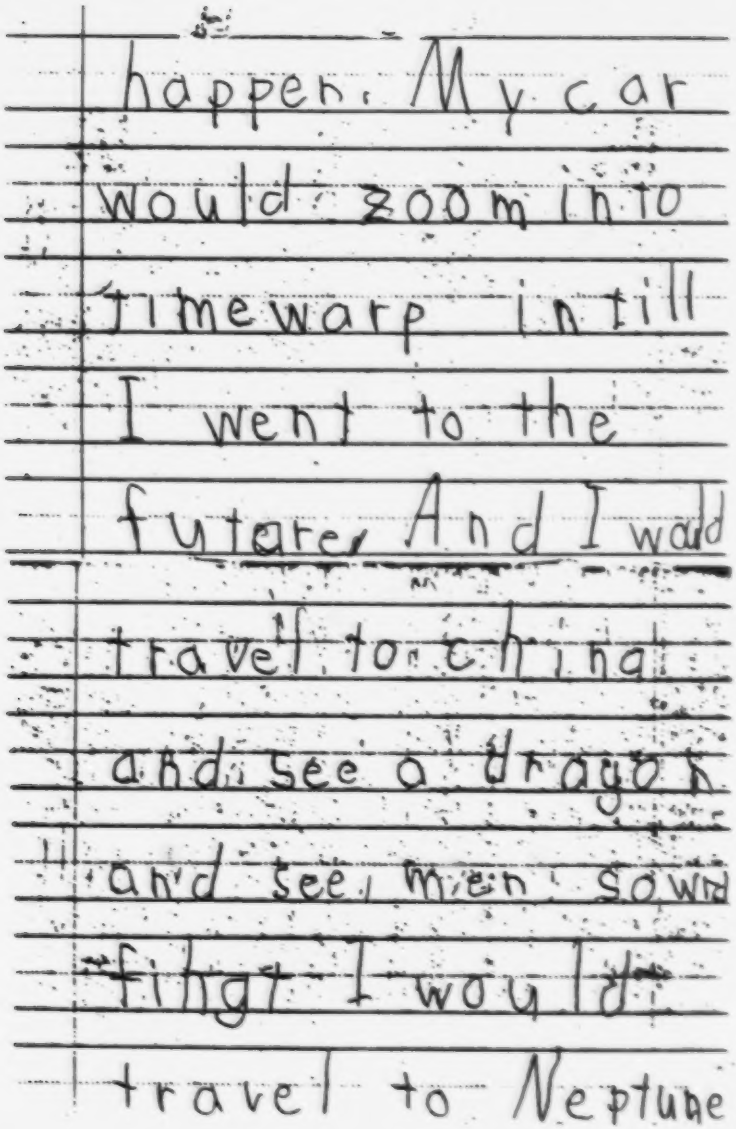

Once I tooka ride into a magic car and I whet to a magic land and cald Pinkvally evry sigl thing was pink I was so sorprsed It was a magic land and I went to explor evrything was pik I didn't want to go back be cuese I like the color. I stad thar for



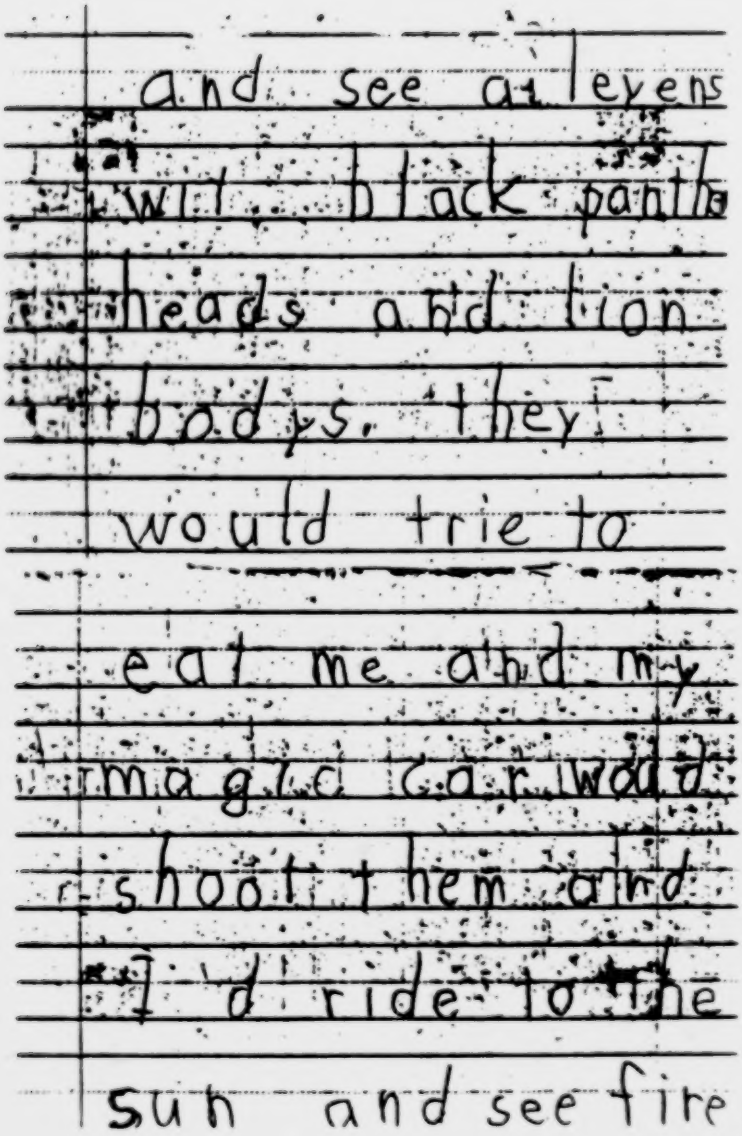
meny days and evrything
and evry where was pink
I had so much fun but
I wanted to go back
home so I packed up

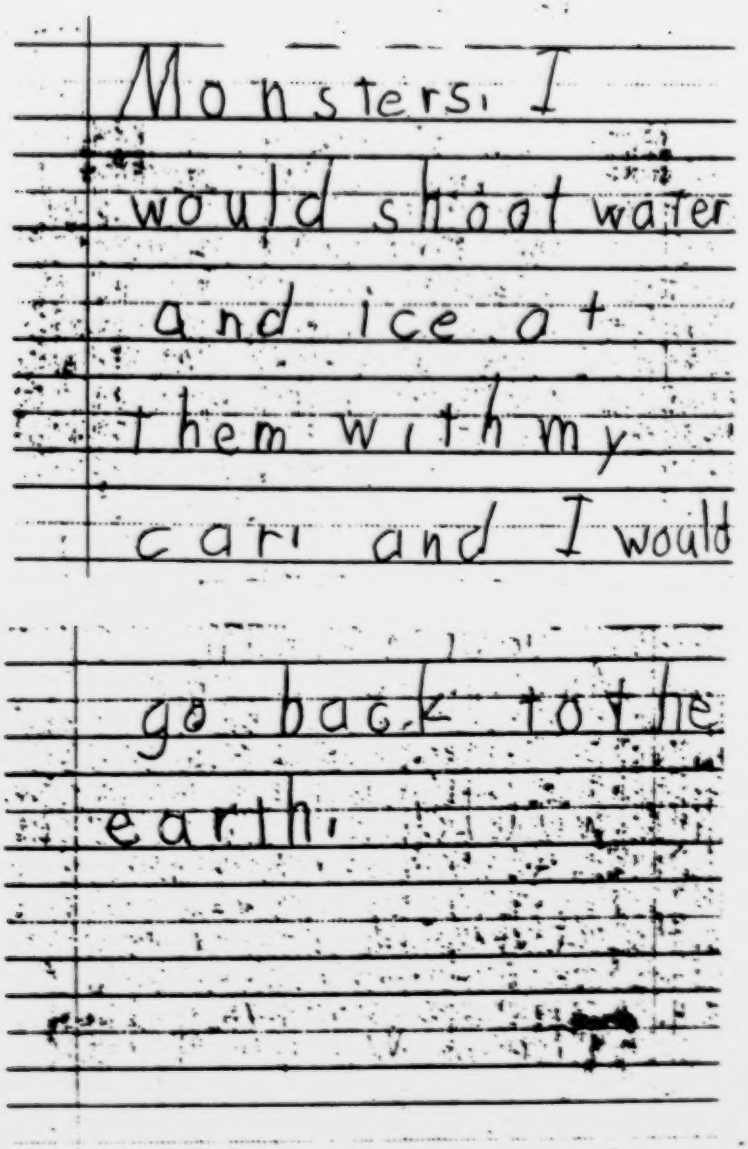
turth was three
planits from here I
was there by 9:00 clok
and I was glad to be
home THE End


Onee I took a ride
in a magic car.
I drove to a place
with magic that
floating in the air
and that is where
my magic car
got gas. The magic
in the air would
make happy things



happen. My car
would zoom in to
timewarp in till
I went to the
futare. And I wadd
travel to china
and see a dragon
and see men sowd
fihgt I would
travel to Neptune


and see a leyens
wit black panth
heads and lion
bodys. they
would trie to
eat me and my
magic Carwad
shoot them and
I d ride to the
sun and see fire.


Monsters. I
would shoot water
and ice at
them with my
car. and I would
go back to the
earth.

Appendix I

Letter Soliciting Teachers' Participation
in Scoring of Writing Samples

FORT WORTH INDEPENDENT SCHOOL DISTRICT
RESEARCH AND EVALUATION DEPARTMENT
3210 WEST LANCASTER
FORT WORTH, TEXAS 76107
(817) 336-8311

March 31, 1986

Dear Kindergarten or First-Grade Teacher:

In May, the Department of Research and Evaluation will be conducting a study regarding the development of writing skills in kindergarten and first-grade students. We will need the assistance of several teachers for the scoring of writing samples.

Each teacher who participates will be asked to work on Saturday, May 10, 1986, for three to six hours. Each teacher will be paid $16 per hour of work. The length of time involved will depend on the number of teachers who participate. You do not need to have had any special training to participate. All training necessary will be presented as part of the day's activities.

We think you will find this to be a very interesting experience, one which will increase your understanding of the development of writing skills in young children. If you are interested in participating, please complete the attached form and send it to the name and address listed on the back. Simply fold and staple that form so that the address is on the outside and return it in the school mail.

Those who are selected to participate will be notified by May 1, 1986.

If you have any questions, please contact me at extension 408 at the Administration Building. Thank you.

Sincerely,

Nancy W. Naron, Ph.D.
Program Evaluator

/zm
enclosure

Appendix J

Tally of Scores on Kindergarten Training Samples

Intended Scores	Scores Given by Trainees*							
	6	5	4	3	2	1	0
6	14	2					
1					3	13	
5	1	10	5				
2				4	12		
4		1	10	4	1		
3	1	1		14			
0						1	15

*The total number of kindergarten trainees included one central office administrator who did not participate as a scorer.

Appendix K

Tally of Scores on First-Grade Training Samples

Intended Scores	Scores Given by Trainees*							
	6	5	4	3	2	1	0
6	18	4	2				
1				1	6	17	
5	7	14	2	1			
2			1	2	16	5	
4		5	15	4			
3		1	3	17	1	2	
0							24

*The total number of first-grade trainees included one central office administrator who did not participate as a scorer.

Appendix L

Cost of Repair of IBM PC Jrs.
under IBM Service Contract

CPU Service Cost Per Year

$ 135.00 On Site Service By IBM
75.00 Carry In Service, Dallas

Color Monitor Service Cost Per Year

$ 32.50 On Site Service By IBM
24.00 On Site Customer Service *
22.00 Carry In Service, Dallas
22.00 Carry In Exchange, Dallas

Pro-Printer Service Cost Per Year

$ 41.00 On Site Service By IBM
35.00 On Site Customer Service *
30.00 Carry In Service, Dallas
30.00 Carry In Exchange, Dallas

(*) Pickup and Delivery by IBM. Customer unplugs and replugs the equipment.

Based upon current information, we have the following units in service.

CPUs	182
Color Monitors	182
Pro-Printers	18
Speech Attachments	128
Parallel Printer Attachments	80

By taking the least expensive method available, carry in service or product exchange in Dallas, I estimate the cost to have IBM service the PC jrs, and their peripheral equipment for one year to be $ 18,194.00. You would also have the expense of a delivery person to transport the equipment to and from Dallas, Texas.

Note: Speech and Paralle Printer Attachments are serviced free when attached to the CPUs.

Appendix M

Estimated Costs of Repair of IBM PC Jrs.
under District Maintenance Plans

Regular Purchase Price Program

Part	Quanity	Unit Price	Total Price
System Board	10	$ 520.00	$ 5,200.00
Memory Board	6	189.00	1,134.00
Power Supply Board	2	141.00	282.00
Disk Drives Complete	13	425.00	5,525.00
Speech Attachments	3	300.00	900.00
Keyboard Cords	5	20.00	100.00
		TOTAL **	$ 13,141.00
		Plus 40%	5,256.00
		TOTAL **	$ 18,397.00

Board Exchange Price Program (which may not be available to the district)

Systen Board	10	$ 136.00	$ 1,360.00
Memory Boards	6	49.00	294.00
Power Supply Board	2	141.00	282.00
Disk Drives Complete	13	318.00	4,134.00
Speech Attachments	3	300.00	900.00
Keyboard Cords	5	20.00	100.00
		TOTAL **	$ 7,070.00
		Plus 40%	2,828.00
		TOTAL **	$ 9,898.00

If the 52 units that were released from the warehouse require the same percentage of parts as the 128 in use, we will need to increase the two totals by another 40% to cover their parts cost. I have shown this increase above.